THE

AMERICAN JOURNAL OF PHARMACY

JULY, 1852.

ON ERYTHROPHLEUM JUDICIALE, (THE SASSY BARK TREE OF CAPE PALMAS.)

By William Procter, Jr.

The first paper on this subject, published at page 301, vol. xxiii of this Journal, was necessarily imperfect in its botanical relations, owing to the flowers of the plant not being among the specimens on which the account was based, the tree being in fruit at the time they were collected. Since then I have received from Dr. McGill, through Moses Sheppard, Esq., of Baltimore, several very perfect specimens of the inflorescence of the Sassy bark tree, preserved in diluted alcohol, by which its characters have been studied, and are presented in the following essay.

After a careful examination of accessible works on the botany of Western Africa, no further accounts of the Sassy tree or allied trees have been found, than those mentioned in the first essay. Neither Endlicher, Lindley, nor Don, who give the generic characters of Erythrophleum, (Afz.) mention any species, or give the specific characters of any of them.

The *Red water tree* of Sierra Leone, first noticed by Winterbottom in his account of that colony, (vol. i. p. 129,) was afterwards noticed by Professor Afzelius, who resided several years in that region, and was erected into a new genus Erythrophleum* distinct

* From the red color of the bark.

from Inga, to which genus it and several allied species had been referred. Robert Brown, in his botanical appendix to Tuckey's narrative of an expedition to Congo, p. 467, states that "the ordeal tree noticed in Professor Smith's journal under the name of cassa, and in captain Tuckey's narrative, erroneously called a species of cassia, if not absolutely the same plant as the *red water tree* of Sierra Leone, and as it is said of the Gold Coast, belongs at least to the same genus." Mr. Brown further states, in speaking of the leguminous plants of the Congo expedition, "Of the second order Cæsalpineæ, the collection contains nineteen species, among which are four unpublished genera. One of these is Erythrophleum of Afzelius, the *red water tree* of Sierra Leone, another species of which genus is the ordeal plant or *cassa* of the natives of Congo."

In subsequently describing the plants collected by Denham and Clapperton, (see Brown's appendix to D. and C.'s travels, p. 234,) Mr. Brown observes, that several leguminous plants have been discovered in western Africa with the clubshaped spike, which have characters fully sufficient to distinguish them from Inga, to which they had hitherto been referred. These plants have been classed together, the type of the tribe being the genus Parkia, one of the most striking and beautiful of equinoxtial Africa, so named by Mr. Brown, "as a tribute to the memory of the celebrated traveller." Mr. Brown further says, "I have formerly endeavored to distinguish mimoseæ from cæsalpineæ, by the valvular æstivation of its floral envelopes, and by the hypogynous insertion of its stamens. Instances of perigynous insertion of stamens have since been noticed by MM. Kunth and Auguste St. Hilaire."

"Erythrophleum, another genus indigenous to equinoctial Africa, which I have elsewhere had occasion to notice (vid. ante) and there referred to cæsalpineæ, more properly belongs to mimoseæ, *although its stamens are perigynous.* In this genus, both calyx and corolla are perfectly regular, and their æstivation if not strictly valvular, is at least manifestly imbricate, though the flower buds are neither acute nor angular. In Erythrophleum and Parkia, therefore, exceptions to all the assumed characters of mimoseæ are found, and there is some approach in both genera to cæsalpineæ."

A careful study of the specimens from Cape Palmas, in view

of the facts contained in the above quotations, has led to the opinion that the Sassy bark tree is not only an Erythrophleum, as supposed in my former essay, but closely resembles the *Red water tree* of Sierra Leone, as supposed by R. Brown in reference to the ordeal plant of Congo. The reasons for this belief, in the absence of the specific characters of the Sierra Leone tree, are, the proximity of Cape Palmas to the latter colony, the similar application of its bark as an ordeal, and its strong coloring power when infused in water, which property has given name to the Sierra Leone plant. On the other hand, the alternate position of the folioles of the sassy tree, whilst those of the red water tree are opposite, render their identity at least doubtful.

As no specific name has been given to the red water tree—and as the sassy bark tree may be identical, I have called it Erythrophleum *judiciale*, in reference to its use by the natives.

ERYTHROPHLEUM, *Afz.*—Natural order, FABACEÆ; sub order, MIMOSEÆ, and tribe, PARKIEÆ, of Lindley.

Generic characters.—Flowers, hermaphrodite, regular. *Calyx*, five-limbed, subimbricated. *Corolla*, five petals. *Stamens*, perigynous. *Legume*, compressed, bivalved, and many seeded. (*Endlicher, Gen. Plant*, p. 1323). They are tall tropical African trees, with bi-pinnate leaves, opposite folioles, flowering in terminal and lateral racemes.

Erythrophleum judiciale, is a large tree with numerous spreading branches, the latter covered with a smooth bark, greyish colored externally, whilst on the trunk and larger branches the bark is rough, corrugated and fissured, and has a ferruginous red color, with light colored excrescences. The *leaves* are bi-pinnated: the pinnæ are articulated oppositely on the general petiole, and vary from three to six or seven pairs, according as they are taken from near the flowering terminus of a branch, or below. The terminal pinnæ are longer, and the folioles larger, than those near the base of the leaf. The *leaflets* are sub-petiolate, obliquely ovate and acuminate, from one to three inches long, alternate or in pairs nearly opposite, smooth, entire, coriaceous, and varying from three to five or six on a side. The bark of the twigs and younger branches is covered with light colored dots, which extend to the bases of the peduncles and petioles. *Inflorescence.*—The sassy tree flowers in compound spike-like racemes; that is to say, all the

terminal buds, often thirty or forty, develope as flower buds, each producing a raceme, so as to form large panicles. The spikes or racemes which are articulated with the branched flower-stems, vary in length from three to six inches, and when the flowers are fully expanded, are from six to eight lines in diameter. The peduncles are cylindrical and fluted, and the flowers are arranged around them on short pedicels, about half a line to a line in length, varying from one hundred to four hundred in number. Their close arrangement, short pedicels and exsert stamens, give them somewhat the aspect of the catkins of some amentaceæ. The florets expand nearly equally, which gives to the inflorescence of the sassy, a graceful and plume-like aspect. FLOWERS.—*Calyx* regular, cup-shaped, five-cleft, tomentose externally. (See Fig. 1 *a b*.) *Corolla*, valvate in expanding, petals five, oblong obovate, very tomentose exteriorly, alternate with the limbs of the calyx. (*a c*.) *Stamens* ten, perigynous, exsert, inserted on either side of the petals, (*c*) filaments cylindrical, smooth, twice the length of the petals, anthers ovoid, two-lobed, yellow, and dehisce longitudinally. At the base of the petals and surrounding the pistil are five glands (*b*) about the size of the anthers. *Pistil*.—The pistil projects beyond the corol la, (*a b*) is as long as the stamens, and consists of an elongated very tomentose ovary, the woolly covering of which increases its diameter one half; and a stigma sessile, conical, smooth, about one sixth as long as the ovary, and furnished at top with a round foramen. When sliced longitudinally the ovules are visible. (*d*) *Legumes*, from two to four inches long, and from one to two wide, violin shaped, chestnut colored, coriaceous, compressed, obtuse at both ends when fully developed, bivalved, two to five-seeded, and dehisce by the dorsal suture. *Seeds* have an oblong oval flattened shape, are black, and covered with a very gummy transparent substance, analogous to cerasin. The episperm is hard and horny, enclosing a tough hard light grey albumen, nearly surrounding the cotyledons, which are compressed, indurated and of a yellowish green color.

One of the features of this species Erythrophleum, is the sparsity of fruit compared with the abundance of inflorescence, as may be observed by comparing figures 1 and 2. The former represents but one branch of a terminal panicle of flowers; the latter, all the fruit of the whole panicle that reached maturity. This habit is quite common, however, as noticed

Fig 1.

a. A perfect flower. *b*. Calyx spread open, showing the pistil and nectaries. *c*. Flower spread open and pistil removed, with the position of two of the stamens exhibited. *d*. Section of the pistil.

Fig. 2.

in the horse chestnut, and other American trees. The remark of Mr. Brown in reference to the æstivation of Erythrophleum and Parkia, is true of this species; on a few of the spikes, the terminal flowers had not expanded, others but partially so, with the stigma protruding, in which the valvate relationship of the petals was sufficiently apparent.

The chemical researches relative to the active principle of the bark have not been resumed at this time, but may be continued on another occasion. In illustration of the singular use to which sassy bark is put by the natives, the following quotation from Winterbottom's Sierra Leone, (page 129, vol. i.) may prove interesting.

"Upon the Gold Coast, the ordeal consists in chewing the bark, with the prayer that it may cause his [the accused] death, if he be not innocent. In the neighborhood of Sierra Leone, the most usual mode of trial resembles that by bitter water, formerly in use among the Jews, and is called *red water* by the Africans.

"The red water is prepared by infusing the bark of a tree, called by the Bulloms, *kwon*, by the Timmanees, *okwon*, and by the Soosoos, *millee*, in water to which it imparts a powerfully emetic and sometimes purgative quality. In some instances it has proved immediately fatal, which leads to a suspicion, that occasionally some other addition must be made to it, as it does not appear that the delicate are more liable to be thus violently affected by it than the robust. To prevent, however, any suspicion of improper conduct, the red water is always administered in the most public manner in the open air, and in the midst of a large concourse of people, who, upon these solemn occasions, never fail to assemble from all quarters, particularly the women, to whom it affords as good an opportunity of displaying their finery and taste in dress, as a country wake in England does to the neighboring females. The accused is placed on a kind of stool three feet high, one hand being held up, and the other on his thigh, and beneath the seat are spread a number of fresh plantain leaves. A circle of about seven or eight feet in diameter is formed around the prisoner, and no one is admitted within it but the person who prepares the red water. The bark is publicly exposed, to show that it is genuine. The operator first washes his own hands, and then the bark, as well the mortar and pestle with which it is to be powdered, to prove that nothing improper is concealed therein. When powdered, a calabash full is

mixed in a large brass-panful of water, and is stirred quickly with a kind of whisk, until covered with a froth like a lather of soap. A variety of ceremonies and prayers are performed at the same time, and the accused is repeatedly and solemnly desired to confess the crime with which he has been charged. A little before he begins to drink the infusion, he is obliged to wash his mouth and spit the water out to show that he has nothing concealed in it; a little rice or piece of kola is then given him to eat, being the only substance he is allowed to take for twelve hours previous to the trial; and in order to prevent his obtaining anything else, he is narrowly watched by a number of people, who are responsible for his conduct. After having repeated a prayer dictated to him, which contains an imprecation upon himself if he be guilty, the red water is administered to him in a calabash capable of holding about half a pint, which he empties eight, ten, or a dozen times successively as quick as it can be filled. It probably now begins to exert its emetic powers, but he must, notwithstanding, persist in drinking, until the rice or kola be brought up, which is easily seen upon the plantain leaves spread below. Should vomiting not be caused, and the medicine produce purgative effects, the person is condemned immediately; or if it be suspected that the whole of what he has eaten is not brought up he is permitted to retire, but with this reserve, that if the medicine produce no effect on his bowels until next day at the same hour, he is then and not before pronounced innocent, otherwise he is pronounced guilty. When the red water proves purgative, it is termed 'spoiling the red water.' The utmost quantity which may be swallowed is sixteen calabashfuls; if these have not the desired effect, the prisoner is not allowed to take any more. When neither vomiting or purging are produced, the red water causes violent pains in the bowels, which are considered as marks of guilt. In such cases they endeavor to recover the patient by exciting vomiting, and to sheath the acrimony of the red water they give him raw eggs to swallow. In some instances, the person has died after drinking the fourth calabash.

"When the accused is permitted to leave the tripod upon which he is seated, he is ordered to move his arms and legs to show that he has not lost the use of them. When he dies upon the spot, which frequently happens, or when the red water is *spoiled*, and the party is too old to sell, one of his family, unless he can redeem himself with a slave, is taken and sold."

REACTION BETWEEN IODINE AND THE ESSENTIAL OILS.

By G. W. Patterson, M. D.,
Resident Physician of the Northern Dispensary.

Having had occasion, recently, to prepare an ointment of *Iodide of Sulphur*, I was surprised to find on adding a drop of oil of bergamot to the iodide previously pulverised, that a rapid interchange of elements ensued, accompanied with an evolution of the violet vapor of iodine, and the odor of sulphur. Upon subsequently experimenting with other essential oils, I found that oil of juniper, savine, caraway, valerian, and lemon, produced a similar effect when added to that iodide. I furthermore ascertained, that none of the other iodides were perceptibly affected by the essential oils.

On adding oil of lemon, bergamot and turpentine, to iodine alone, a phenomenon ensued resembling that produced when iodide of sulphur was acted upon.

I do not know that this incompatibility between iodine and the volatile oils has heretofore been noticed, and although it may be considered of no great practical importance, still it is something interesting.*

It happens occasionally, that although certain medicinal agents are chemically incompatible with each other, nevertheless the medical quality desired is not lost by such combinations, as may be instanced by the collyrium which was at one time much employed, and which consisted of sulphate of zinc, acetate of lead, and water. The mistura ferri comp. of our Pharmacopœia, is also an instance of the kind referred to.

But when substances are combined, capable of undergoing such change as to render the combination unfit to meet the therapeutical indication of a case, the physician must be disappointed, and confidence in medicine destroyed.

*[Note by Editor.—The reaction between iodine and the volatile oils is noticed by Liebig, (*Chimie Organique*, tome. ii p. 309, 1842,) where he remarks, "All the essential oils put in contact with iodine, produce a kind of explosion, in which the oils yield hydrogen to the iodine at the same time that a part of the iodine takes the place of the eliminated hydrogen." It is this sudden evolution of gas that causes the explosion, whilst the heat consequent upon the reaction, vaporizes a portion of the iodine. M. Zeller (*Jahrbuch für Praktische Pharm., Juli*, 1849,) has taken advantage of this

property of iodine, as a means for detecting adulterations, in quite a list of the volatile oils, founded on the fact that this element reacts with very different degrees of rapidity with different oils. We are not aware that the reaction has been noticed before in relation to the iodide of sulphur. At first we supposed, that Dr. Patterson had inadvertently used an iodide partially decomposed, but on repeating the experiment with some recently prepared, the same phenomenon occurred. The very loose state of combination of the elements of this salt, may account for its ready decomposition in the presence of certain volatile oils.]

ON AN EXPEDITIOUS METHOD OE PREPARING PILULÆ HYDRARGYRI.

By James Beatson,

Apothecary U. S. Naval Hospital, New York Station.

The minute division of the mercury in this preparation, is generally looked upon as an index to its therapeutic effects, and in order to accomplish this, various kinds of machinery have been employed.

By a very slight modification of the formula, I have found the pestle and mortar sufficient for supplying all our demands. I have used it for many years, and it has given me the most satisfactory results:

℞.	Hydrargyri	℥xxxij.
	Mellis Despumati	℥vj.
	Aquæ Rosæ	f℥viij.
	Sacchari	℥xxx.
	Rosæ Gallicæ pulv.	℥iv.
	Glycyrrhizæ pulv.	℥xvj.

The proportion of honey, rose water, sugar, and rose petals, corresponds with the officinal formula for "Confectio Rosæ," but instead of mixing the mercury with the confection thus prepared, I triturate the mercury with the honey until the former is completely extinguished; I then heat the rose water, add it along with the sugar, continue the trituration, and then add the powdered rose petals and liquorice root in succession.

I thus have a uniform mass, of one third mercury, perfectly extinguished, and with a very trifling amount of labor.

ON THE CHLORINE LAMP OF DR. HILDRETH.

By William Hodgson, Jr.

In the "Boston Medical and Surgical Journal, Feb. 11th," is a notice by Dr. Hildreth, of a method of eliminating chlorine, which appears to possess some interest. He says:

"Having recently had occasion for the use of chlorine as a disinfecting agent, I was led to consider whether there might not be some method more convenient and efficacious than that usually adopted for its evolution. Though the gas extricated by the new method is not chlorine, but chiefly hydrochloric acid, yet it seems practically of at least equal efficiency for deodorizing purposes.

"Chlorine is usually generated by the action of sulphuric acid upon a mixture of binoxide of manganese and chloride of sodium; by the action of the same agent upon the chlorides of lime or soda; or by the simple exposure of the latter in open vessels. If, in the first process, the binoxide of manganese be omitted, hydrochloric acid is evolved; this latter method is in popular use. Even where the manganese is present, much hydrochloric acid is given off, and if pure chlorine be desired, manganese and sulphuric acid only should be used. In either process the application of heat is necessary.

"The first of these methods is inconvenient, and requires considerable attention. By the second, the gas is rapidly liberated, but the supply is soon exhausted, and the materials must soon be replenished. The third is simple and convenient, but not sufficiently efficacious.

"The plan which I propose is simple and efficient. It consists in the combustion of chloric ether in a common lamp.

"The gas arising from the decomposition of the ether has been analyzed by Dr. Bacon, and found to be hydrochloric acid, with a trace of chlorine. Practically, I have not found it less efficacious than pure chlorine for disinfecting purposes. It has been used to a considerable extent in the Massachusetts General Hospital, and gives no inconvenience to the patients. Its odor may be plainly perceived upon entering a ward where the lamp is burning, and in proper quantity it is far from disagreeable. So far as has been observed, it exerts no injurious influence upon the furniture or metallic utensils in the wards. Its deodorizing powers are fully equal to those of chlorine.

"For purifying the wards of hospitals, or the private apartments of the sick; for deodorization during an autopsy in a private house; for use in dissecting rooms, and for numerous similar purposes, I apprehend the chloric ether lamp will be found convenient, inexpensive and efficacious.

"I would remark that the proper material for combustion in the lamp is the 'strong chloric ether' used for inhalation, and not the chloric ether of

the Pharmacopœia. The latter does not furnish a sufficient quantity of the gas to be efficacious. If the former is not easily attainable, a tincture of chloroform, of the strength of one part of chloroform to six or eight of alcohol, will answer quite as well; in fact, the 'strong chloric ether' is nothing more than a tincture of chloroform.

"The lamps used for burning camphene are well adapted for this purpose, being provided with a small cap or extinguisher, which covers the wick and prevents evaporation of the ether when not in use. I have made, extemporaneously, a very excellent lamp by inserting two or three inches of glass tubing, of the diameter of a No. 16 bougie, through the cork of a wide-mouthed phial."

The proposal in the foregoing communication would offer a very neat mode for evolving chlorine for either inhalation or fumigation, if the gas produced was mainly chlorine. But the experiments which I have made in the burning of tincture of chloroform, have much disappointed the hopes with which, notwithstanding Dr. H.'s admission of the presence of muriatic acid, I first received the announcement. That chlorine is evolved, is unquestionable. But the proportion of this is so small, and that of chlorohydric acid so large, in the products of the combustion, that I greatly doubt whether it can be brought into useful competition, in any way, with the other methods of obtaining the disinfecting—certainly not the bleaching—effects for which chlorine is so well known. For some purposes of inhalation, it may possibly prove useful, conveying as it does the chlorine gas to the patient in a very dilute and not very disagreeable form; but this must of course be confined to cases in which the presence also of muriatic acid gas is not objectionable; unless, by the intervention of a vessel of water the latter could be absorbed, and the chlorine alone, with the requisite dilution by atmospheric air, applied to the lungs or other absorbing vessels of the patient, as required.

Dr. Hildreth speaks of the "strong chloric ether used for inhalation" being the proper kind to burn, "and not the chloric ether of the Pharmacopœia." What he has in view by the latter, I do not know, as there is no such thing in the United States Pharmacopœia, nor, so far as I am aware, in any of those of the British Colleges. But from several trials that I have made, I am inclined to think that the "strong chloric ether," made by dissolving one part of chloroform in two parts of alcohol, will not answer for burning, nearly so well as a tincture made by mixing two fluid

drachms of chloroform (equal to about 3¼ drachms by weight) with four fluid ounces of alcohol. The latter burns clear, with scarcely any smoke; whereas the former produces so much smoke and soot as to be very offensive.

As chloroform contains about 90 per cent. of chlorine, one fluid ounce of the above proposed tincture (containing about 11¼ per cent. of chloroform) would have in its composition about 45 grains of chlorine, equal, if evolved in that form, to about 59 cubic inches of chlorine gas, or a little more than two pints. But until further examinations or experiments are pursued, we are in the dark as to the *chlorine value* of the resulting gas, as distinguished from the chlorohydric acid.

Philadelphia, 5th mo., 1852.

EXTRACTUM LOBELIÆ FLUIDUM.

By William Procter, Jr.

Having had occasion to prepare a fluid extract of lobelia at the solicitation of a druggist, the following process was employed, which is based on the fact, that in the presence of an excess of acid, the lobelina of the natural salt which gives activity to the drug is not decomposed and destroyed by the heat used, as explained on a former occasion, (vol. xiv. page 108 of this Journal.)

Take of Lobelia (the plant) finely bruised,	eight ounces, (troy)
Acetic acid	one fluid ounce.
Diluted alcohol	three pints.
Alcohol	six fluid ounces.

Macerate the lobelia in a pint and a half of the diluted alcohol, previously mixed with the acetic acid, for twenty-four hours; introduce the mixture into an earthen displacer, pour on slowly the remainder of the diluted alcohol, and afterwards water until three pints of tincture are obtained; evaporate this in a water bath to ten fluid ounces, strain, add the alcohol and when mixed, filter through paper.

Each teaspoonful of this preparation is equal to half a fluid ounce of the tincture. It may be employed advantageously to

make a syrup of lobelia, by adding two fluid ounces of the fluid extract, to ten fluid ounces of simple syrup, and mixing. Syrup of lobelia is an eligible preparation for prescription use, in cases where lobelia is indicated as an expectorant.

ON FALSE MANNA.

By Robert P. Thomas, M. D.

An article has recently been introduced into this market and offered for sale under the name of manna, which differs so much both in its physical and chemical properties from what is generally understood as constituting a good manna, as also from the descriptions given in standard works of the various products floating about in European commerce bearing this name, that a short account of it, bringing the subject before the notice of the pharmaceutical profession may prove serviceable.

The article in question was brought here from New York; but whether it was of foreign origin, and had passed accidentally through the Custom House before or since the passage of the Inspection law, or whether it is of domestic manufacture, I am unable to ascertain. The probabilities are, however, that it has been imported.

It comes in large casks, packed in separate pieces weighing about half a pound. These pieces are of an oblong shape, from five to seven inches in length and from one and a half to three inches in breadth; and half as much in thickness; the angles being rounded off by pressure of the pieces upon each other. Each piece is carefully enveloped in long and broad leaves of some endogenous plant. When these are first removed, there is a strong odor exhaled, not unlike that of the drainings of old molasses casks. By exposure to the air the odor becomes more faint and saccharine. The taste is very sweet in those portions which are perfectly dry, whilst in darker and moister parts the sensation of sweetness is followed by a decided and permanently bitter taste. The dry surface is of a yellowish brown color, studded with numerous glistening points; in the damper portions

the shade of brown is much deeper, in some places being nearly black. The whole surface is rough and irregular. The fracture is equally rough and irregular, exhibiting many crystalline points, and here and there well defined crystals of cane sugar. The mass is made up of small compressed and flattened pieces that bear no inconsiderable resemblance to preserved citron. Both water and alcohol (sp. gr. ·835) dissolved about ninety per cent; water taking up a somewhat larger proportion than alcohol. The residuum is tasteless and odorless, and has a pectinous pulpy consistence after the action of water.

Prof. Wm. Procter, Jr., made some experiments with a view of determining its chemical nature, which, although not pushed so far as to decide on the character of the bitter principle, were sufficient to satisfy him, that the so-called manna does not contain any mannite, the saccharine constituent of all mannas, but that, on the contrary, its sweetness is owing to the presence of a large proportion of cane sugar with a little glucose.

A portion was boiled in alcohol (sp. gr. ·835,) strained while hot and set aside to cool and crystallize. At the expiration of 60 hours no crystals had formed. Had mannite been present, delicate crystalline needles would certainly have been deposited prior to the expiration of this period.

A second portion was dissolved in water, strained and concentrated to a syrupy consistence. Upon standing, well defined oblique, four-sided, transparent crystals were deposited in great abundance. These crystals were charred by sulphuric acid, but slightly affected by a boiling solution of caustic potassa, and when heated in an alkaline solution of sulphate of copper, afforded little if any evidence of grape sugar, whilst the brown mother liquor was blackened by boiling potassa solution and readily precipitated oxide of copper when the copper test was applied. No therapeutical experiments were made, inasmuch as the bitter after taste would preclude its use even as a substitute for fat manna, my object being simply to expose a gross adulteration.

OIL OF GAULTHERIA PROCUMBENS.

LANCASTER, May 20, 1852.

PROF. WM. PROCTER, JR., Philadelphia.

Dear Sir,—Your favor of the 18th came to hand, and I regret that I am not able at this time to give you more information about the use of Ess. Gaultheria in intermittent, than that it was very much used in the summers of '50 and '51, among the poorer class of people who live along the Conestoga, with much success; their manner of taking was a tea-spoonful before or at the time the first symptom appeared, and occasionally after the chill a dose; no particular regard to their diet or living.

The above was furnished to me by a middle aged man who had tried it himself, but without success; he, however, is much afflicted; quinine, barks and arsenic appear to have lost their effect upon him. He has chills every day.

Dr. Gerber purposes trying it upon some of his patients; his experience and observations I will give you shortly, though not in time for the next number of the Journal.

I make the Essence by dissolving ℥j. Ol. Gaultheria in Oij. of alcohol, and color with tincture of Saunders.

I must ask your indulgence, promising that if it does contain any virtues I shall advise you; as to its diuretic properties I am not able to say. Very truly,

CHARLES A. HEINITSH.

NOTE BY THE EDITOR.—We were induced to solicit further information on the above subject than was obtained in a casual conversation with Mr. H. some time back, more especially as the oil of winter-green thus far appears to have been used only as a perfume and flavoring agent. Another reason is, that recently, statements have occurred in the French Journals regarding the volatile oil of Spirea ulmaria or salicylous acid of chemists, a substance very analogous to the oil of Gaultheria procumbens in its sensible and chemical properties; the oil of spirea being a hyduret of salicyle, whilst the oil of gaultheria is the oxide of salicyle, or salicylic acid, united with the hydrated oxide of methyl. M. Hannon, in *Bull. gen. de Therap*, quoted in *Jour. de Pharm.*, for Jan., 1852, has given the results of some experiments with that oil in cases of hypertrophy of the heart, and in phthisis, wherein it manifested diuretic powers in a marked degree. M. Hannon has employed the oil of spirea in doses of 3 or 4 drops in the form of a tincture, and also has administered the compounds of the oil with potassa

and soda. Now as oil of gaultheria has the same specific gravity, odor and taste, and combines with the alkalies and as well as with chlorine, iodine and bromine as does the other oil, it is by no means improbable that it possesses therapeutic properties, perhaps analogous, or, if distinct, yet sufficiently interesting to attract and repay the attention of the physician. Should the information of Mr. Heinitsh, in relation to the alleged antiperiodic powers of oil of gaultheria be corroborated, it will prove as valuable in its medicinal, as it is extraordinary and interesting in its chemical relations.

SUPPOSITORIES.

By A. B. Taylor.

As our National Dispensatory gives no account of this valuable class of medicinal applications, (*suppositoria*) a brief notice of their preparation, in the "American Journal of Pharmacy," will perhaps be serviceable to some of its readers. Though hitherto but little employed in this country, suppositories have long been extensively used in France. They have recently, however, attracted the attention of some of our physicians, and bid fair to grow into much more general demand.

They may be described as medicated compounds of a stiff consistence, designed to be introduced into the rectum, and serving the purposes of the ordinary clysters or injections; (*Enemata.*) They are applicable in all cases of constipation, or of irritability, or inflammation of the lower intestines; and have the advantage over liquid injections, of more easy introduction, as well as of greater comfort and cleanliness; and they may sometimes be retained, when liquids would not. There is, perhaps, no substance so well adapted to serve as the vehicle of these applications, as the butter of cocoa, (*oleum cacao,*) as no combinations of suet, spermaceti, or wax, &c., combine in so great a degree the proper hardness or firmness of substance, with the requisite fusibility.

The following formula, is a prescription of Dr. S. W. Mitchell and has been considerably used.

Take of Cocoa Butter	℥iss.
Powdered Opium	gr.xii.

Mix and make into twelve suppositories.

The butter of cocoa is to be melted by a gentle heat. The opium is then to be well rubbed up with a small quantity of the fluid, until thoroughly incorporated, and the remainder of the melted butter gradually added. When cool and slightly thickened, the mass, being well stirred, should then be poured into paper cones.* If the cocoa butter is too fluid when transferred to the moulds, the opium will settle to the apex of the cone, and not be properly diffused through the substance. When perfectly hard, these cones should then be pared or scraped at the base, until they weigh just one drachm,—giving one grain of opium to each suppository. Practically, therefore, it will be necessary to make one less than the required number,—reserving the parings for another operation.

The following formula has been prescribed by Dr. Pancoast:

Take of	Cocoa Butter	℥i.
	Extract of Krameria	ʒii.
	Powdered Opium	gr.v.

Mix and make into ten suppositories, as above.

It is stated that cocoa butter is much esteemed in France, for its supposed healing qualities, and is a favorite application in cases of piles. With powdered galls, or tannic acid, this substance would therefore probably form a useful substitute for the ordinary pile ointment. The proportions to be employed, would of course be regulated entirely by the physician's order.

In DORVAULT'S French work on "Practical Pharmacy," suppositories are described as varying from the size of the little finger, to that of the thumb; and weighing, from ʒi¼ to ʒii½; (five to ten *grammes*.) The author gives as a formula for the vehicle, butter of cocoa melted with an eighth part, by weight, of white wax: or as an inferior substitute, and one less used, common tallow mixed with the same proportion of wax. Soap suppositories are formed by simply cutting soap into convenient shapes. Suppositories are also prepared from honey, by boiling down this substance till it becomes sufficiently hard to retain its shape. There are also formulæ given for anthelmintic, anti-hemorrhoidal, astringent, emmenagogue, laxative, and vaginal suppositories;

* These moulds should be made of sized or writing paper, and may be conveniently placed in shallow boxes of sand, to preserve their position.

as well as belladonna, calomel, cicuta, mercurial, and quinine suppositories.

In GRAY'S "Supplement to the Pharmacopœia," there is given the following formula for a suppository; taken from the *Codex Medic. Hamberg*, 1845.

℞.		
	Aloes	ʒvi.
	Common Salt	℥iss.
	Spanish Soap	℥iss.
	Starch	ʒviii.

Mix and make into a mass with honey, and then form into cones of the required size.

ON HOFFMAN'S ANODYNE LIQUOR.

By WILLIAM PROCTER, JR.

Perhaps in no preparation in general use does the practice of manufacturers, and the requirements of pharmacopœial authorities, more widely differ than in the Compound Spirit of Ether, universally known as Hoffman's Anodyne Liquor. According to the United States and London Pharmacopœias it consists of three fluid drachms of heavy oil of wine (Oleum Ethereum, U. S. P.) dissolved in a mixture of eight fluid ounces of ether and sixteen fluid ounces of alcohol. The Edinburgh Pharmacopœia has only the simple spirit of ether without the oil of wine, whilst the Dublin Pharmacopœia of 1850, under the name of Spiritus Ætherеus Oleosus, gives the following formula, which includes the preparation of the oil of wine and its subsequent solution to make the anodyne: Mix a pint of alcohol and a pint and a half of oil of vitriol in a glass matrass, adapt a Liebig's condenser, and by heat distill until a black froth rises. Separate the lighter ethereal liquid in the receiver, expose it for 24 hours in a capsule, wash the residual oil with water, and dissolve it in a mixture of five fluid ounces of ether and ten fluid ounces of alcohol. In France, Hoffman's anodyne consists of equal parts of ether and alcohol without oil of wine.

Owing to the careless or intentionally mystified manner of ex-

pressing himself, it is impossible now to ascertain whether the original preparation of Hoffman (published in 1732) was constant in its strength, as now recommended by the Pharmacopœia. Beaumè, (as quoted in Macquer's Chem. Dict., London, 1771,) says, in speaking of the rectification of sulphuric ether, "By distilling the liquor in the first receiver, together with a very small quantity of oil of tartar, by a very gentle heat of a lamp furnace, about two pounds and four ounces of pure ether may be obtained; and afterwards when a new receiver is adapted, and a stronger heat applied, from eight to ten ounces of aromatic liquor, which makes a good *anodyne mineral liquor of Hoffman*, will be distilled."

The third edition of Lewis' Dispensatory, published at Dublin, 1768, has the following formula for this preparation which appears to be what the apothecaries of that day employed:

"*Hoffman's Mineral Anodyne Liquor.*"

Into half a pound of concentrated oil of vitriol, placed in a large glass retort, pour by little and little, through a long stemmed funnel, one pint and a half of highly rectified spirit of wine. Stop the mouth of the retort, digest for some days, and then distil with a very gentle heat. At first a fragrant spirit of wine will arise; and after it a more fragrant volatile spirit, to be caught in a fresh receiver. The receiver being again changed, a sulphurous, volatile, acid phlegm comes over, and at length a *sweet oil of vitriol*, which should be immediately separated, lest it be absorbed by the phlegm. Mix the first and second spirits together, and in [every] two ounces of this mixture dissolve twelve drops of the sweet oil. If the liquor has any sulphurous smell, re-distill it from a little salt of tartar.

"Whether this is the exact preparation, so much recommended and so often prescribed by Hoffman as an anodyne and anti-spasmodic, we cannot determine. We learn from his own writings that his anodyne liquor was composed of the dulcified spirit of vitriol, [crude ether] and the aromatic oil which rises after it; but not in what proportions he mixed them together. The College of Wirtemburg seems to think that all the oil was mixed with all the spirit obtained in one operation without regard to the precise quantities."

The product of this recipe must have been analogous to the present officinal spirit, the formula for which is evidently modeled after it. The great excess of alcohol distills over first, until the boiling point rises to the ether producing temperature, when ether is obtained, and finally the sulphurous oily product. The re-

cipe gives no direction to isolate the oil of wine before measuring it, which is perhaps less necessary, as the ethereal part of the distillate is removed previously to the production of the oil which is found in the receiver in globules, and not in solution.

The process now adopted by the manufacturers in this city avoids the isolation of the oil of wine, and from the nature of the conditions the product is liable to vary in the proportions of its ingredients, not only in different laboratories, but at different operations in the same laboratory. In the preparation of ether it is usual in this city to push the process as far as possible, as long as the residue is not so concentrated as to eliminate much permanent gas. In the rectification of this first crude product, the distillate is reserved as rectified ether as long as its specific gravity marks 54° Baumé, or there about. By continuing the process the product is found to consist of ether, alcohol and water, impregnated with oil of wine. Every one who has made ether knows how very liable the product is to vary with an ill regulated heat; on the one hand unaltered alcohol will pass over if the temperature is too low, whilst too great a heat, especially towards the last of the process, will favor the formation of oil of wine and sulphurous acid. This last distillate, therefore, will vary in composition, and it is from this that Hoffman's anodyne is made in some of the best of our laboratories. *There is no known practicable method of ascertaining the per centage of heavy oil of wine in this liquid.* The means used by the manufacturer are founded on the sensible properties of an arbitrary standard specimen of Hoffman's anodyne previously made, and on the degree of opalescence or milkiness it produces when added to a certain measure of water. This milkiness is occasioned by the oil of wine present; but experience has shown that the degree of milkiness is not strictly in proportion to the quantity of oil present, the relative proportion of ether and alcohol, and perhaps water present in the anodyne liquid has a marked influence on the phenomenon; if too much alcohol, the milkiness is not produced, or but partially; if too much ether, oily globules separate and float with but moderate opalescence. In converting his second ethereal distillate into commercial Hoffman's anodyne, the operator has to make several essays, sometimes adding water, sometimes alcohol or ether, until the taste, the smell, and the opalescence agree,

as nearly as can be approached with his standard specimen. In the process of rectification it is probable that at least a part of the heavy oil of wine is decomposed, with the production of the light oil or etherole, and that the commercial Hoffman's anodyne differs in this respect, as well as in containing a much smaller proportion of oil of wine, from that of the Pharmacopœia.

To get a better idea of the preparation in use here, authentic specimens were obtained from four of our largest manufacturing chemists, and compared with compound spirit of ether made for the occasion strictly according to the United States Pharmacopœia. Their density was carefully taken with the 1000 grs. bottle.

A, Wetherill & Brothers	specific gravity at	60°	F.	.8925
B, Smith, Pemberton & Co.	"	"	"	.8723
C, Rosengarten & Dennis	"	"	"	.8495
D, Powers & Weightman	"	"	"	.8394
E, U. S. Pharmacopœia	"	"	"	.8151

Equal measures of each specimen and distilled water were mixed together; they all produced opaque milky liquids; globules of oil of wine soon separated from the mixture with E and floated on the surface, while the liquid gradually lost its opacity as more of the oil arose. The mixture with D became less opaque by standing, a small portion of oil rising to the surface. The mixtures with A B and C retained their opacity without apparent separation of oil of wine, A being the most so.

A was the mildest and least repulsive to the taste, because least ethereal. C was the next least ethereal, but had pungency not arising from ether. B was more ethereal than the preceding, notwithstanding its greater specific gravity. D was yet more charged with ether. E presented sensible properties differing from all the others, being more ethereal and aromatic, but without a peculiar taste noticeable in the other specimens, more especially in C.

When 2½ fluid drachms of each specimen was shaken in graduated tubes with 60 grains of carbonate of potassa, they were dehydrated somewhat in the ratio of their specific gravities. A and B dissolved the salt readily by a few minutes' agitation, and the separated aqueous alkaline solution equalled a third of the bulk of the mixture. In C and D only about half of the salt was dissolved, whilst in E the salt was merely rendered pasty.

To get an idea of the proportion of ether present in these specimens, a solution of dry chloride of calcium in an equal weight of water, was made. Five parts of this solution was mixed with three parts of each of specimens of Hoffman's anodyne, in tall tubular vials, corked, well agitated and allowed to stand for twelve hours. In A, B, and C, no separation of ether occurred, but in each of them a few globules arose to the surface, consisting chiefly of light oil of wine. In D, a stratum of ether holding oil of wine in solution, equal to one seventh of the bulk of the spirit used, or nearly half a part. Whilst in E, the super-stratum of ether equalled one third of the spirit used, and had a light yellow color, due to the oil of wine.

These data will give an approximative idea of their compositions; it would appear that A was chiefly alcohol and water with but little ether; that B contained almost as much water as A but less alcohol and more ether; that C contained much less water than A or B, but less ether and more alcohol than B, and more ether and less alcohol than A; that D contained rather more water than C, but more ether and less alcohol than either of the preceding; and lastly that E contains more ether, and less alcohol and water than either of the others.

In regard to the proportion of ethereal oil, the experiments give no positive clue. It would appear that B and D contained the most among the commercial specimens, and that D approaches nearest the composition of the officinal spirit, yet all of them when compared with the officinal are deficient in this ingredient.

It must be apparent from these results, that the opacity of a mixture of Hoffman's anodyne and water, is no index of the proportion of oil of wine the former contains, that property being dependant apparently on the state of combination in which the oil exists, nor would we pronounce on the medicinal value of the specimens, a task belonging to the physician. Whatever curative reputation the compound spirit of ether may have earned, certainly belongs to the commercial spirit, and not to that of the Pharmacopœia, which is not to be had in the shops.

The exact nature of the liquid left after the rectification of ether is an inquiry well worthy of further investigation. The alcohol of commerce is not a homogenous substance. Besides water it contains odoriferous oily matter, produced in the original fermentation,

and which is not wholly removed in the rectification of whiskey. This matter, modified by the action of sulphuric acid and heat, with the volatile substances generated during the ether process, are contained in it. It may also be that the ether in this residue is more intimately combined with water than in a mere mixture of water, alcohol, and ether of the same strength, as suggested to me by Mr. Pemberton.

The question very naturally arises, why do not the manufacturers prepare the officinal Hoffman's anodyne, or why do they not furnish the ethereal oil of the Pharmacopœia, that the apothecary may make it himself by simple mixing? There are several reasons. 1st, the apothecary, the physician, and to a large extent the consumer, have become accustomed to the present commercial preparation, and the majority, both of apothecaries and physicians, would reject the true officinal spirit, if presented to them, as not correctly made; 2d, druggists, as a general rule, would refuse to pay the greatly increased price, absolutely required to remunerate the manufacturer, for the greater consumption of time and materials, and increased skill and risk in manipulation. Having on several occasions prepared the officinal oil of wine and Hoffman's anodyne, I can corroborate the statements of Mr. Kent, at p. 255, relative to the small yield, and consequent costliness of officinal heavy oil of wine. The so-called oil of wine, which is imported into this city from England, and which is sometimes employed for making the officinal spirit, is an ethereal solution of etherole, one specimen yielding only seven per cent. of it. And 3d, in the preparation of ether, the residue left in the still after the rectification of the ether above 54° Beaumé, must either be thrown away, or converted to the only use to which it can be applied with advantage, viz., Hoffman's anodyne. It is for this reason that the price of the commercial "anodyne" is so low, being about fifteen cents per pound.

It may become a question in the next revision of the Pharmacopœia, whether it would not be better to reconstruct the formula for compound spirit of ether, somewhat on the plan of the manufacturers, or that quoted at page 213, from Lewis's Dispensatory, so as to render it more practicable and likely to be followed. Of course it should be done with due consideration of the difficulties involved in the production of a spirit of uniform strength.

PHARMACEUTICAL NOTICES.

Being extracts from various articles in the New York Journal of Pharmacy, with comments, by the Editor.

Stramonium ointment, by Eugene Dupuy. The author notices the new formula (Pharm. 1850,) for this preparation, and considers it objectionable on the ground of its not possessing the green color of the old ointment by infusion. He proposes to remedy this difficulty by the following process, viz:

"Take of Stramonium leaves	half a pound
Alcohol 95°	a sufficient quantity
Prepared Lard	fourteen ounces.

Moisten the leaves previously reduced to coarse powder, with sufficient alcohol, in a tight vessel having a suitable cover; melt the lard in a pan three times in capacity to the bulk of the lard, and stir in gradually the prepared Stramonium; keep the mixture in a warm place for five hours, stirring occasionally, till the alcohol has disappeared from the ointment, which may be ascertained by applying a lighted match to the surface of the warm ointment after stirring and then filter hot. Thus prepared the ointment has a handsome green color, and according to Mr. D. is a reliable preparation.

The objection to the officinal formula on the score of color is hardly valid, and if it was so, it would be better to color it when desirable with *alcoholic extract of grass*, than to substitute a preparation which will constantly vary in strength and appearance with the age of the leaves. The officinal extract of stramonium is easily incorporated with lard, and produces a brown colored ointment, of comparatively uniform strength.

On Blistering Cerate, by Eugene Dupuy. "I have been for many years in the habit of preparing a plaster which, I think, has some advantages over our officinal cerate, because it fixes the volatilizable principle, and at the same time rather increases than diminishes its energy.

"To the officinal plastic mixture in which the powdered cantharides have been gradually incorporated, I add about five per cent of a mixture containing equal parts of strong acetic acid, (prepared by the distillation of the acetate of copper or lead) and pulverized camphor. The acetic acid transforms the can-

tharidin into an acetate of the same which is not volatilized at ordinary temperatures, and the camphor diminishes the symptoms of stranguary which some patients have to endure when the application of blistering plaster is resorted to."

We do not undertand in what way acetic acid, itself a very volatile substance, should be able to *fix* cantharidin, which our author himself properly calls a *neutral* substance, so as to form an *acetate*. According to Mr. Redwood, (Pharm. Jour. Oct, 1841,) acetic acid is not a good solvent for cantharidin and the Acetum Cantharidis (Lond. Ph.) owes it rubefacient action to the acid chiefly. In reference to the volatility of cantharidin, the following experiment shows that this principle is not so volatile as some authors state it to be. 100 grains of powdered cantharides was introduced into the bottom of a test tube by means of a tube funnel so as not to soil the sides. A large tube with the upper end drawn out to a small orifice was placed over the mouth of the test tube, whilst the closed end containing the flies projected through a tin cover into a vessel of water which was kept boiling for six hours. At first the hygrometric water of the flies was condensed above and removed, and at the end of the experiment a minute deposit of microscopic crystals was observed, not exceeding the thirtieth of a grain. This experiment is part of an investigation of the subject of cantharides not yet ready for publication.

On Mucilage of Gum Arabic, by George D. Coggeshall. The author considers the officinal formula for Mucilage of Gum Arabic as nearly useless, in as much as it is rarely followed in the practice of extemporaneous pharmacy. He thinks that one ounce to seven ounces of water comes near the average practice of apothecaries, and intention of physicians, and that the solution is better when made from the unpowdered gum with cold water, as in the process for syrup of gum. He further remarks, "Upon the whole it seems desirable that there should be a uniform strength for the mucilage of gum arabic, prescribed by physicians in mixtures, which the officinal preparation evidently is not. Our mucilage does not enter into other officinal preparations, and if it did, the combination of gum and water had better be made in general process, as in our almond mixture."

We object to Mr. Coggeshall's idea of reducing the strength

of this preparation, or to removing it. The term "Mucilage" most properly applies to a solution of gum of the officinal strength, which is that most appropriate for emulsions, for which use it is chiefly designed. Unfortunately, physicians are not sufficiently impressed with the meaning of the officinal term, and use it when they desire a demulcent solution for cough mixtures, which as a general rule is very properly made of the strength (1 to 7 of water) suggested by Mr. Coggeshall, and which we would gladly see made officinal under the name "Liquor Acaciæ," or some other.

Compound Spirit of Lavander. Mr. Coggeshall objects to the officinal formula for this preparation on the score of using the simple distilled spirit of lavander in its preparation, which is difficult to procure, weak, and rarely used. He also objects to the employment of a solution of the oil of lavender as a substitute, owing to its general inferior quality, and to its separating on mixing the spirit with water. As a substitute for the officinal formula he proposes the following recipe, which he has employed for several years with entire satisfaction, viz:

"Take of Lavander flowers, twelve ounces (Troy.)
" Rosemary leaves, bruised.
" Cinnamon bruised, each four ounces and a half.
" Nutmegs, bruised.
" Cloves, bruised each six drachms.
" Coriander seed, bruised.
" Red Saunders, rasped, each three ounces.
" Powered Turmeric, one drachm.
" Alcohol, six pints.
" Water, five pints and a quarter.
Mix, digest for fourteen days, express and filter."

We agree with the author in his opinion of this formula, and we hope at the proper time either this or one similar in its character will be introduced into our national codex.

Syrup of Gum Arabic. Mr. Coggeshall finds fault with the formula for syrup of gum in the present Pharmacopœia, and prefers that of 1830; and he wonders at its removal in 1840. Its proverbial tendency to decomposition, as made in 1830, caused its removal, instead of its revision, as should have been done.

We regret that Mr. C. is not satisfied with the present formula, which we thought has given almost universal satisfaction.

Syrup of Citric Acid. Mr. Coggeshall recommends two drachms of the tincture of recent lemon peel to be used instead of four minums of oil of lemon in the preparation of this syrup.

Syrup of Ipecacuanha. The formula for this preparation has received a fearful blow from the critical pen of Mr. Coggeshall. He considers it faulty in language, in manipulation and in strength, and little "calculated to answer medical wants in regard to its importance." Mr. Coggeshall speaks of New York, where he says it is not probable that the present officinal syrup of ipecacuanha can ever supercede the efficient and reliable one we have so long been accustomed to, nor answer the wishes and expectations of the medical profession. I append the formula proposed in a paper read before the Board of Trustees in 1835, seven years before this syrup appeared in our Pharmacopœia. I have not found cause to change it in any respect. It affords about three pints of syrup, which keeps well for years at the ordinary temperatures of the shop, and dwellings; the proportion of sugar proves to be just what is wanted for a proper consistence without crystallization, and, as a medicine it gives entire satisfaction to the prescriber. It is as follows:

Take of Ipecacuanha, bruised, six ounces (troy.)
Alcohol, one pint and a half.
Water, one pint.

Mix to form a tincture. Digest for ten days, filter and add one pint of water by way of displacement, evaporate in a water bath to two pints, add immediately,

Refined sugar three pounds and a quarter (troy)

and bring to the boiling point."

This preparation when finished will therefore be *four* times the strength of that of the Pharmacopœia, and decidedly *alcoholic* which is the reason it keeps well. Such a syrup would undoubtedly be more efficient in croup or other disease requiring the rapid emetic action of ipecacuanha; but we may doubt the advantage of substituting it for the officinal syrup in a very large number of cases where the diaphoretic and expectorant, action is needed.

The syrup of the French Codex, (1837) and of the Edinburgh

Pharmacopœia, 1839, is about equal in strength to that of the United States Pharmacopœia, and we do not see why the revisors of the latter work can be censured for not adopting a formula the particulars of which they were perhaps not aware of, and the increased strength of which they did not approve.

Compound Syrup of Squill. Mr. Coggeshall objects very properly to the first process of the U. S. Pharm. for this syrup, as yielding an inelegant preparation. He objects to the second process also on the ground that the diluted alcohol is not as strong, or in as large quantity as it should be. In view of these *presumed* defects the following formula is offered.

" Take of Seneka bruised, Squill bruised, each four ounces.
Alcohol, Water, each two pints.
Mix to form a tincture. Digest ten days, filter, and add twelve ounces of water, by way of displacement, evaporate by water bath to two pints, add
Sugar, fifteen ounces. Honey eighteen ounces,
Boil to three pints and a half, in which dissolve while hot,
Tartar emetic fifty-six grains."

In commenting on these remarks we would suggest that cold water alone is quite adequate for the extraction of seneka and squill, but both in squill and seneka there exists mucilaginous and gummy matters which interfere with the process of percolation when water is used. The addition of one sixth of alcohol in the United States process is to facilitate the passage of the solvent, and to cause it to reject a part of the mucilage. There is no objection to having it more alcoholic, perhaps an advantage. In reference to the quantity of menstruum, it is sufficient, provided the officinal directions for conducting the displacement process are carefully followed. The formula offered by Mr. Coggeshall presents an anomaly in syrups—so far as consistence is concerned. But 15 ounces of sugar and 18 ounces of honey (about 13 fluid ounces) in 56 fluid ounces of syrup! This is almost as far out of the way as the old process of 1830. Besides it is impossible to follow the directions *to boil to three pints and a half*, because 18 ounces of honey and 15 (troy) ounces of sugar when dissolved in two pints of the evaporated tincture, *will not measure* 56 fluid ounces before the ebullition commences, certainly not after it. Further; such a syrup will not keep, *unless* so much alcohol is retained in the

preparation as will interfere with its value. It is well to recollect that in the evaporation of diluted alcohol, the water as well as the alcohol passes off, and that the evaporation of 4 pints of a tincture to 2 pints does not remove all the alcohol.

Tincture of Aconite root. Mr. Coggeshall, in common with some others, believes that Fleming's Tincture (16 ounces of root to Oiss. of alcohol) is to be preferred. As three different revising committees in as many countries, with that formula in view, have, however, adopted the proportion of six ounces to 16 fluid ounces, we cannot see why objection should be urged. If in special cases a stronger tincture is needed, make it, but when the officinal formula is adequate in nineteen cases out of twenty, let us not meddle with it. Besides, we are apt to speak of saturated tinctures without being aware of the limit to the solvent power of menstrua. The observations of M. Personne (American Jour. Pharm. vol. xviii, pages 21 and 108,) are well worth perusal; and *a priori* we do not believe that the most skilful manipulator in New York or Philadelphia can extract the whole of the activity of 16 oz. aconite root with 1½ pints of alcohol, allowing him sufficient of the menstruum in addition to displace out a pint and a half of tincture.

Compound Tincture of Cardamom is objected to by Mr. Coggeshall because it is stronger of cardamom than the London formula, previously in use. If this tincture is merely used as a *coloring* agent in prescriptions to please the fancy, the objection holds good, but as it was introduced chiefly for its carminative qualities, the increased force communicated by the cardamom is advantageous.

Pilulæ Ferri Compositæ. By Benjamin Canavan. The author considers the officinal directions insufficient to develope the chemical changes evidently desired in the construction of the formula, viz. the formation of proto-carbonate of iron. He suggests that "the *only* way by which the pill ought or can be prepared, is by triturating separately and to solution the two salts in the necessary quantity of syrup, mixing, and again triturating until perfect decomposition is induced, and by incorporating the myrrh, form into a mass without delay." This suggestion is a decided improvement on the officinal direction. In our own experience we have arrived at a simular result, by reducing the two salts and the myrrh, in tears, separately to powder, then triturating the sulphate

of iron with about half a drachm of syrup, until reduced to a smooth paste, afterwards adding the carbonate of soda, rubbing until the decomposition is finished, and lastly adding the myrrh and incorporating it. The use of the unpowdered myrrh will be found to give a peculiar consistence to the mass, arising from the intimate admixture of the oleo-resinous particles with the salts.

Mistura Amygdalæ. Mr. Canavan proposes, instead of keeping the solid ingredients of this mixture ready mixed as recommended by the Pharmacopœia, that the almonds be preserved for use after being *blanched and well dried*, in which state they are not liable to change as when the kernel is beaten into a paste with sugar and gum.

Liquor Potassæ Arsenitis. In a note on this subject Mr. Canavan states that a shop bottle of Fowler's solution, which had been kept some six or twelve years, exhaled a strong garlicky odor characteristic of free metallic arsenic. The interior surface of the bottle was found to be corroded, and possessed a metallic lustre which Mr. Canavan considered to be metallic lead, eliminated from the flint glass by the action of the solution; as it was slowly acted upon by acetic acid it yielded iodide of lead with iodide of potassium. This is a curious fact, probably due to the excess of alkali in the arsenite. We do not understand where the garlicky odor came from, as it is only the *vapor* of metallic arsenic that possesses this peculiarity.

ON THE NITRATE OF SODA DEPOSITS OF SOUTHERN PERU.

In the twenty-first volume of the Journal of the Royal Geographical Society, is a descripton of the province of Tarapaca, in Southern Peru, from which the following account of the deposits of *nitrate of soda* is taken.

"The existence of this valuable substance in the province of Tarapaca, has been known in Europe about a century. In 1820, some of it was sent to England, but the duty then being so high, it was thrown overboard. In 1827, efforts were unsuccessfully made by an English house to import it. In 1830, a cargo was sent to the United States; it was found unsaleable there, and a

part of it taken to Liverpool, but was returned as unsaleable in England. A cargo was then sent to France, and in 1831 another to England, where it became better known, and sold as high as 30*s*. to 40*s*. the cwt. Its price has varied very much; present quotations (1851) about 15*s*. Since 1830 to 1850, the exports of nitrate from Iquique, have been 5,293,478 quintals, equal to 239,860 tons; some of it being used as a fertilizer of land, some in the manufacture of nitric acid.

The principal deposits of nitrate of soda yet known, are found on the western side of the Pampa de Tamarugal, commencing immediately where the level plain ceases, and on the sides of some of the ravines running from the Pampa towards the coast, and in some of the hollows of the mountains. The nitrate has not been found nearer to the coast than eighteen miles, and looks as if it gradually transferred itself into salt as it approached the coast. The officinas, or refining works are divided into northern and southern salitres; the old salitres being about the centre of the former, and La Nueva Norvia that of the latter; there are in all about one hundred.

The nitrate deposits commence about Tiliviche, and extend S. near to Quilliagua, with interruptions of deposits of common salt. The nitrate caliche grounds vary in breadth; the average may be five hundred yards, and in places seven or eight feet thick, and sometimes quite pure. In the ravines and hollows, before mentioned, the nitrate is found on the shelving sides; the hollows look like dried up lakes, and are covered with salt two or three feet thick, and on the margin there is nitrate of soda, oftimes going down to some depth; in others there is a hard crust upon it, occasionally four feet thick. The nitrate caliche found under this crust is in thin layers, and so solid and pure as to be sought for, although the expense of blasting is very great.

There are several varieties of the nitrate of soda caliche; the following being the principal:

1. White compact, containing sixty-four per cent.
2. Yellow, occasioned by salts of iodine, seventy per cent.
3. Grey compact, containing a little iron and a trace of iodine, forty-six per cent.
4. Grey crystalline, the most abundant variety, contains from twenty to eighty-five per cent., affording traces of iodine, with one to eight per cent. of earthy matters.

5. White crystalline; this resembles the refined nitrate. All these contain common salt, sulphate and carbonate of soda, muriate of lime, and occasionally some borate of lime is found under the nitrate beds; one variety of the latter, composed of boracic acid, 49.5; soda, 8.8; water, 26.0; lime, 15.7=100, may probably become of use in this country in glass making, &c.

The rough nitrate of soda is broken into several small pieces, put into boilers, water introduced, and the whole boiled; the nitrate is held in solution, whilst earthy matter, salt, sulphates, &c., are separated and fall to the bottom of the vessel; the saturated solution of nitrate is led into a reservoir, where it deposits any remaining earthy matter; the clear liquor is run into shallow troughs, exposed to the sun; the nitrate of soda crystallizes, containing only two to three per cent. of impurities, and is ready to be conveyed to the coast for exportation.

The Pampa de Tamarugal, contains sufficient nitrate for the consumption of Europe for ages; the desert of Atacama, yields it; it has also been met with in the Andes, and in the eastern plains.

ON HELLEBORUS NIGER.

By G. Walpers.

M. Walpers gives a minute description of the rhizome of Helleborus niger, for the purpose of distinguishing it from similar roots with which it is liable to be confounded. The plants, whose roots seem to be most easily mistaken for the officinal, are Helleborus viridis, Adonis vernalis, Actæa spicata, Astrantia major, and Helleborus fœtidus. They may be distinguished by the following characteristics.

Helleborus niger.—The dried rhizome is odorless, dark chestnut brown, from the thickness of a swan-quill to that of the little finger, drawn up, branching, many-headed, rendered somewhat knotty by the cicatrices of the leaf-stalks, the elevated margins of which form dish-like excavations, beset with radicles from one to two lines in diameter, six to twelve inches in length, and, in general, but little branched; these break with a horny fracture,

showing a clean white internal structure, and in the middle a small, more transparent medulla, which, under a magnifier is usually sharply 4–5 cornered. The taste is at first slightly sweetish, then sharp and radish-like. In old specimens this sharp after-taste is frequently wanting.

Helleborus viridis.—Of all those mentioned, the rhizome of this plant has the greatest resemblance to that of Helleborus niger. It is branching, many-headed, drawn up, marked with dish-like cicatrices of the leaf-stalks, beset with long, solitary radicles, ½—¾ of a line in diameter, the color generally grayish-black, but towards the origins of the leaf-stalks, grayish-green, even in the dry condition. The radicles break with a horny fracture, are grayish-green internally, marked in the middle with a white, sharply four-cornered, cross-shaped medulla. The taste is radish-like and disgustingly acrid.

Adonis vernalis.—The rhizome has also some similarity to that of Helleborus niger; it may be recognized, however, by its radish-like odor. It is also cognoscible by the presence of a number of dry, membranous, brownish-colored, and scale-like leaves, by the want of the circular scars of the leaf-stalks, as well as by the longitudinally wrinkled, fragile, and strongly odorous radicles, which, upon fracture appear grayish green, and have a white, sharply 4—5 cornered medulla.

The rhizomes of the remaining plants have a less close resemblance to the officinal.

Actæa spicata.—The rhizome is thick, fleshy, many-headed, marked toward the apex with ill defined cicatrices of the leaf-stalks, which, although circular, never form dish-like excavations. It is beset with long, yellowish-brown, much ramified, and at last thread-like radicles; a smooth fracture of the stronger of these, shows a distinct cortical portion, and an obtusely 3—5 rayed medulla. The taste is slightly bitter, but not radish-like.

Astrantia major.—This has a thick, fleshy, many-headed, blackish-brown rhizome, of a somewhat resinous odor in the fresh state, without smell when dried, beset with much ramified, and at last thread-like radicles, the thicker of which are from ¼—½ a line in diameter, and have a brownish-yellow cortical portion, and a white rounded medulla. Toward the apex of the rhizome are found ring-form scars of the leaf-stalks, or the yet remaining leaf-stalks themselves. The taste is feebly bitter.

Helleborus fœtidus.—It is not easy to mistake the root of this plant for that of Helleborus niger. It is thick, woody, much-branched, and of a chestnut-brown color. Upon examination of an oblique section of the fresh root, of the thickness of the finger, a light-green pith cylinder may be observed, blending, as it were, with the cortical portion; if the root be dried, this entirely disappears. The radicles have a ligneous fracture, and internally, a yellowish color.

With the aid of the microscope the difference between these roots may also be demonstrated. It is necessary, however, in connection with other observations, to study sections of the radicles; for this purpose the smaller are to be preferred. M. Walpers thus describes the microscopic structure:

An oblique section of the radicles of Helleborus niger, shows a thick cortical portion, surrounded by a stratum of semi-cylindric, rather thick-walled epidermis cells, dark brown only on their external wall. The cortical layer consists of large, tolerably compact, 5—6 sided parenchyma cells, which are closely filled with minute, spherical, conglomerate fecula granules. The medullary body is irregular, sharply 4—5 cornered, and consists of very thick-walled, reticulately punctate vessels. Between the projecting rays of the medulla is a collection of thin-walled elongate cells, filled with fecula granules and oil globules. In several places the bundle of vessels of the medullary portion is invaded by pith-cells similar in form to those of the cortex, and like them filled with fecula.

Helleborus viridis differs, inasmuch as the cortical layer of its radicles contains but few fecula granules, and many oil globules. The central portion is compact; the vessels are reticulated in the same manner, but are never invaded by pith-cells; there are, indeed, but few pith-cells visible.

Very much the same structure may be remarked in the radicles of Adonis vernalis; the epidermis-cells, however, are not only brown on their external, but also on their internal walls. The cells of the cortical and medullary layers contain minute spherical, but not conglomerate fecula granules, together with numerous oil-globules. The central portion, consisting of dotted vessels, is sharply 4—5 cornered, either compact, like that of Helleborus viridis, or divided by 4—5 rayed pithy bodies into as many star-formed and separate fascicles of vessels.

The radicles of Actæa spicata may be distinguished at a glance, not only by the want of any intercellular arrangement between the thickly filled cells of the parenchyma of the cortex, but also by a peculiarity of the cell-walls themselves, which resemble, in this respect, those of many of the Orchideæ; each cell being provided with minute, obliquely directed, interlacing fibres; these, if the fecula be removed by means of a small hair pencil, are easily recognized. The central body, consisting of bundles of vessels arranged in a wide net work, accompanied on the external side by thin-walled parenchyma cells, is marked with from 3—5 deep, and obtusely wedge-shaped rays. Upon a smooth oblique section this form of medulla may be observed with the unassisted eye.

The radicles of Astrantia major have a dark brown epidermis, surrounded by obtusely conical, occasionally elongate glandules, consisting of a single cell. The parenchyma cells of the cortex are filled with rather large, rounded fecula granules, which are covered with a resinous matter; from this originates the brownish color of the cortical layer, which may easily be perceived in a recent fracture. The obtusely five-cornered medullary portion encloses a pith similar to the parenchyma of the cortical layer, and a net work of vessels, accompanied by thin-walled elongate cells.

Finally, an oblique section of the radicles of Helleborus fœtidus shows a broad cortical stratum of regularly disposed parenchyma, which, in the root taken up in June, contains no fecula, and but little intercellular matter; it is distinctly separated from the central portion by darker colored, somewhat contracted cells. The rounded, obtusely cornered medullary body contains no pith in the radicles, but is made up of thick walled wood-cells, and vessels of a stellate appearance, the peculiar form of which has already been described and figured by M. Schleiden. The inner wall of these vessels is covered by two differently formed layers; the exterior consisting of a very close net-work, while the interior, on the contrary, is furnished with 2—3 rows of very wide pores. As the external vessels are not unfrequently merely marked by the net-work, it would appear, as in the wood of the linden, that the porous layer is the younger. —*Central Blatt, of Feb.* 4, 1852, *from Archiv. der Pharm.*

ON SOCOTRINE ALOE JUICE, OR LIQUID SOCOTRINE ALOES.

By Jonathan Pereira, M. D., F. R. S., Physician to the London Hospital.

It has long been known that the Socotrine aloes imported into England varies considerably in its consistency, and is sometimes met with in a soft or semi-fluid state. Frequently, on opening a package of this sort of aloes the interior is found to be quite soft, while the exterior is firm and hard. In general this arises from insufficient evaporation of the aloe juice.

In the third edition of my *Elements of Materia Medica* (vol. ii., part 1, p. 1077, published in 1850, I have briefly referred to a soft or semi-liquid Socotrine aloes, which had a bright or palm-oil yellow color and odor. At that time I had but little opportunity of investigating this very interesting drug; but a large importation of it having recently taken place, I have more fully examined it, and as it appears to me to be the raw or unboiled juice of the plant yielding what is known in commerce as Socotrine aloes I propose to distinguish it from the ordinary soft socotrine aloes by the name of "*Socotrine Aloe Juice.*"

Messrs. Horner, the holders of the whole of the present importation of this juice, inform me that it was purchased of the Arabs up the Red Sea, by a merchant, who was assured by the vendors that it was very fine aloe juice, and had not been boiled or otherwise altered. It was imported into London by way of Madras, in casks each containing six cwt. I am informed that the contents of some of the packages have undergone decomposition during the voyage.

Its consistence is that of treacle or very thin honey; its color deep orange or palm-oil yellow; its odor powerful, fragrant, and resembling that of fine Socotrine aloes. By standing it separates into two parts,—an inferior, paler colored, opaque, finely granular portion, and a superior, darker colored, transparent liquid. The latter forms, however, a very small portion of the whole mass.

When the granular portion is submitted to microscopic examination, it is found that the opacity and granular appearance arise from myriads of beautiful prismatic crystals. If a temperature of 132° Fah. be applied to the juice these crystals melt or dissolve, and the juice becomes deep red and transparent; and

when the liquid becomes cold it retains its transparency and does not deposit any crystals. By evaporation the juice yields a solid, transparent extract, having all the characters of fine Socotrine aloes, in which no traces of crystalline texture can be discovered. Mr. Jacob Bell has ascertained that 14lbs. of the juice yield 8lbs. 12ozs. of solid extract, or 62½ per cent. When the juice is mixed with cold distilled water, it becomes opaque yellow, and renders the water turbid, but is not miscible with it. If, however, heat be applied, the juice dissolves in the water, forming an almost clear, rich red liquid. As the solution cools, it at first becomes turbid owing to the separation of an opaque yellow precipitate, which, apparently, is the crystalline principle in an amorphous form. This gradually separates from the liquid and collects as a clear resiniform mass (commonly called the *resin* of aloes) at the bottom of the vessel, leaving the supernatant liquid tolerably clear. If the juice be shaken up with rectified spirit of wine an uniform clear mixture is obtained, from which numerous yellow crystals rapidly fall to the bottom of the liquid. Similar results are obtained when we mix the juice with equal parts of rectified spirit of wine and water.

This crystalline constituent of Socotrine aloes is doubtless, either the *aloin** described by Messrs. T. & H. Smith, of Edinburgh, and by Dr. Stenhouse, or a principle closely allied to it. Dr. Stenhouse, to whom I have given a sample of it, is now engaged in its investigation; and in a letter which I have received from him, he says, that though he has not been able to get the aloin ready for analysis, yet, from the experiments he has already made with it, he has scarcely a doubt that it will be found identical with that formerly obtained from Barbados aloes. It forms, he adds, a precisely similar combination with bromine, and, in short, agrees with it in every particular; I shall, therefore, provisionally term this crystalline principle the *aloin of Socotrine aloes.* On comparing it with a fine specimen of aloin kindly presented to me by Messrs. Smith, I find its crystals smaller and more tapering—the summits of the crystals being more acute.

In drying, the crystals of the Socotrine aloin have a strong tendency to break up; so that crystals which in the moist state

*See American Jour. Pharm. vol. xxiii. page 238.

are moderately large and regular, become small and pulverulent when dry. Like the aloin crystals of Messrs. Smith, the aloin crystals of Socotrine aloes strongly doubly refract and depolarize light, and are, therefore, beautiful objects when viewed by the polarizing microscope.

The crystals of aloin contained in Socotrine aloe juice cannot be confounded with the crystals of oxalate and phosphate of lime found in the juices of various plants, and which are called by botanists *raphides*. The appearance under the microscope of the former is very different from that of the latter. Moreover, the ready fusibility, solubility, and complete combustibility of aloin crystals easily distinguish them from the calcareous salts just referred to. On platinum foil the aloin burns without leaving any residue, except such as may arise from the presence of traces of some foreign matter.

Aloin may be readily obtained from the juice by mixing the latter with spirit (either rectified or proof,) and collecting and drying the precipitate. When procured in this way it appears to the naked eye like a yellow powder; but when examined by the microscope it is found to consist of minute fragments of crystals.

The tincture from which the aloin has been separated, yields by distillation a spirit having the fragrant odor of the juice; showing that the latter contains some volatile odorous principle. By evaporation the tincture yields a resiniform extract.

In the first edition of my *Elements of Materia Medica*, published in 1840, I have stated, that by digesting hepatic aloes in rectified spirit of wine, a yellowish granular powder is obtained, which is insoluble in [cold] water, alcohol, ether, and dilute sulphuric acid, but is readily soluble in a solution of caustic potash, forming a red colored liquid. The powder-like residue here referred to, is identical with the aloin of Socotrine aloes. When examined by the microscope, it is perceived to consist of very minute prismatic crystals, which depolarize polarized light like the larger crystals of aloin above referred to. I think, therefore, that it may be safely inferred that hepatic aloes has been prepared without the employment of artificial heat, and that its opacity is due to the presence of minute crystals of aloin.

When Socotrine aloes is digested in rectified spirit an insoluble portion is also obtained; but its color, instead of being yellow,

as in hepatic aloes, is dark brown. On submitting this dark brown insoluble portion to microscopic examination, I find that it contains depolarizing crystals.

Artificial Socotrine aloes (prepared by evaporating this aloe juice) also yields, when digested in rectified spirit, a dark brown insoluble portion.

I think, therefore, that Socotrine aloes differs from hepatic aloes in the circumstance of its having been prepared by the aid of artificial heat; by which its aloin constituent has become altered. This inference is furthered substantiated by the fact, that after it has been melted, hepatic aloes is found to have acquired the clearness and transparency of the Socotrine sort.

The clear supernatant portion of aloe juice, from which the above crystals have subsided, would probably also yield, by spontaneous evaporation, an extract resembling, or identical with, Socotrine aloes.

That Socotrine and hepatic aloes were obtained from the same plant, and were not different species of aloes, I have long suspected; and in the first edition of my work on Materia Medica, published in 1840, I have observed that "the similarity of the odor of Socotrine and hepatic aloes leads to the suspicion that they are obtained from the same plant; and which is further confirmed by the two being sometimes brought over intermixed, the Socotrine occasionally forming a vein in a cask of the hepatic aloes."

This intermixture of the two sorts of aloes in the same cask might be explained by supposing that the consolidation of the clear portion of the juice has produced the so-called Socotrine aloes; while the opaque aloin-containing portion of juice has yielded what is termed hepatic aloes.

In the third edition of my work above alluded to, I have stated that the name of *opaque liver-colored Socotrine aloes* might with propriety be applied to hepatic aloes. But until the present time I have been unable to offer a plausible explanation of the cause of the difference in these two commercial kinds of aloes.

From the preceding remarks I think we may infer:

1. That *aloin* pre-exists in a crystalline form in the juice of Socotrine aloes.

2. That the substance which deposits as a decoction of Soco-

trine aloes cools, and which is usually termed the *resin* or the *resinoid* of Socotrine aloes, is the aloin in a modified state.

3. That hepatic aloes* is the juice of the Socotrine aloes plant which has been solified without the aid of artificial heat.

4. That hepatic aloes owes its opacity to the presence of minute crystals of aloin.

5. That the juice of Socotrine aloes yields, when evaporated by artificial heat, an extract possessing all the properties of commercial Socotrine aloes.—*Pharm. Journ. April*, 1852.

ON THE DISTILLATION OF OIL OF CLOVES AND THE PREPARATION OF BENZOIC ACID BY MEANS OF SUPER-HEATED STEAM.

By Professor E. A. Scharling.

The use of super-heated steam has been advantageously applied in various branches of manufacture, such as the carbonization of wood, the distillation of mercury, the preparation of plaster of Paris, &c. There is, however, no use to which it has been more successfully applied that to the distillation of palm oil, cocoa-nut oil, tallow, and other fatty substances, used in the manufacture of Stearic candles, a manufacture which has now become of considerable commercial importance. There can be no reason to doubt that the use of super-heated steam may also be advantageously applied to the preparation of various Pharmaceutical products. The following is an account of some experiments made by Professor Scharling on the distillation of oil of cloves:—

On passing a current of super-heated steam into a metallic cylinder half-filled with bruised cloves and pieces of pumice-stone, the size of a pea, there were obtained from one pound of Amboyna cloves, of first quality, two ounces and a half of oil, together with

*By the term "*hepatic aloes*" I mean the opaque liver-colored aloes imported into England from the East Indies (usually from Bombay.) This sort of aloes is very different from the *hepatic Barbadoes aloes*, which formerly appears to have been exclusively called "hepatic aloes."

as much water as made the whole produce up to eight pounds in weight. In operating in the same manner on a pound of Bourbon cloves, of first quality, two ounces of oil were extracted on the first day in four hours, and on continuing the operation on the following days an additional half-ounce of oil was obtained. This latter quantity of oil was nearly all obtained in the first two pounds of water which came over. Thus in eight hours additional working, sixteen pounds of water were distilled over, without obtaining a larger result than that given in the first five hours of the preceding experiment.

A third experiment was then made on two pounds of Bourbon cloves, of second quality, and in the course of eight hours three ounces and three-quarters of oil and sixteen pounds of milky water were obtained. In order to collect the principal part of the oil contained in this milky water, and to ascertain whether any advantage would accrue from submitting the cloves to another distillation, all the different cloves which had been previously operated upon, together with the water drawn over, were placed in an ordinary still. On distillation, the first eight pounds of water gave about one ounce of oil. The water which came over afterwards was quite limpid, and after settling several hours no oil whatever separated from it. The apparatus employed in this distillation, consisted of a tinned brass cylinder pierced with holes, eight inches long and five inches in diameter, placed within another and larger cylinder seven inches in diameter; the space between the two cylinders being filled with husks of rice or other analogous material to prevent the escape of heat. To this apparatus is connected a Woulf's bottle, containing a small quantity of water, one orifice of which communicates with the apparatus, and the other with a Liebig's condensing tube. The bottle is covered with flannel. It is thus evident, that with an apparatus as above described, and a due supply of super-heated steam, a large quantity of oil may be obtained in a short time with little expense.

Benzoic acid may also be prepared in the same way; about eight per cent. of the weight of the benzoin used being obtained. The odor of the acid furnished by this process is the same as that obtained in the ordinary manner.

Super-heated steam is readily obtained by passing a current of

low-pressure steam through a coil of pipe, heated to such a point as to be capable of raising the temperature of the steam passing through it to the degree of heat required for the purposes of distillation.—*London Pharm. Journ. April*, 1852.

ON OIL OF CLOVES.

By George Von Hees.

1. Ten pounds of Amboyna cloves yielded in six distillations thirty-one ounces, sp. gr. 1.040.

2. Eight pounds of Bourbon cloves yielded in six distillations twenty-one ounces, sp. gr. 1.034.

3. Twenty-five pounds of Amboyna cloves yielded in six distillations seventy- four ounces, sp. gr. 1.033.

4. Twelve-and-a-half pounds of Bourbon cloves yielded in six distillations thirty ounces, sp. gr. 1.043.

5. Twelve-and-a-half pounds of Amboyna cloves yielded in six distillations thirty-two ounces, sp. gr. 1.038.

6. Twenty-five pounds of Amboyna cloves yielded in six distillations seventy ounces, sp. gr. 1.036.

These experiments show an average of the sp. gr. of 1.0375, and of the oil obtained from ninety-three pounds, two and one-ninth ounces per pound. A quarter of a hundred weight of clove-stalks (*Stipit. caryophill.*) yielded only sixteen ounces of oil of sp. gr. 1.049, differing considerably from the genuine oil in odor and color. All these oils were first prepared by conducting a direct current of steam into the paste-like mass formed by the cloves with water. After the greater portion of water had gone over, it was cohobated, and the distillation continued from without, with condensed vapors of the pressure of three atmospheres.—*Pharm. Jour. April* 1, 1852, *from Archiv. de Pharmacie*, January, 1852.

RESEARCHES ON THE DECOLORIZING PROPERTY OF CHARCOAL AND SEVERAL OTHER BODIES.

By M. E. Filhol.

It is commonly stated that charcoal is the only simple body possessing the property of absorbing coloring matter dissolved in a liquid: it further appears from the works of MM. Bussy and Payen, that decoloration by charcoal is a purely physical phenomenon.

Several compound bodies (alumina, sulphate of lead prepared by the moist way, hydrate of lead) also partake of the property of decolorizing liquids; but it is generally considered by Chemists that the action exercised by oxides on coloring matter in the preparation of lacs is chemical, differing in this respect from that of charcoal; nevertheless, Berzelius was of opinion that the decoloration effected by the oxides and metallic salts, resembled that produced by charcoal.

In the paper which I now submit to the judgment of the Academy, my object has been to prove,

1. That charcoal is not the only simple body possessing the property of decolorizing liquids: sulphur, arsenic, iron obtained by the reduction of the hydrated sesquioxide by hydrogen, are all possessed of decolorizing power.

2. That the number of compound bodies having an appreciable decolorizing power, are more numerous than has been thought, and that this power appears to depend much more on the state of division of these bodies, than on their chemical qualities.

3. That such bodies which easily appropriate one coloring matter, may have but little tendency to do so with another; thus, phosphate of lime from bones (artificially obtained) scarcely decolorizes the sulphindigotate of soda, whilst it exercises a more energetic influence on tincture of litmus than does animal black.

4. That the decoloration, in the majority of cases, is a purely physical phenomenon; thus, the same coloring matter is absorbed by metalloids, metals, acids, bases, salts, and organic substances: it is easy, moreover, by employing suitable solvents to take again the coloring matter in an unaltered state from the body which had absorbed it.

I do not doubt but that these practical data may become the subject of applications useful to analytical chemistry and industry.

The following results, which I have extracted from my memoir, will give some idea of the energy with which certain decolorizing matters act.

My observations have been made by the aid of one of Collardeau's double lunette colorimeters.

The Decolorizing Power of different Substances, compared to that of Purified Animal Charcoal, reckoned as equal to 100.

	Litmus dye.	Sulphindigotate of Soda.
Charcoal	100.	100.
Pure hydrate of iron	128.90	1.97
Alumina	116.	9.91
Phosphate of lime	109.	1.97
Iron reduced by hydrogen	95.33	100.
Milk of sulphur	26.67	0.
Binoxide of manganese (natural)	88.90	13.80
Indigo	80.	13.50
Oxide of zinc	80.	6.55
Stannic acid	70.40	0.
Antimonic acid	66.66	1.97
Chromate of lead	70.40	2.92
Litharge	66.66	3.85
Sulphate of antimony (natural)	59.25	0.
Sulphate of lead	50.	13.80
Binoxide of copper	26.67	0.
Protochloride of mercury	22.22	0.
Sulphate of baryta (artificial)	50.	0.
Sulphate of lead (artificial)	130.	16.67

Pharm. Jour. April 1, 1852, *from Comptes Rendus.*

RESEARCHES ON POPULINE.

By M. Piria, in a letter to M. Dumas.

You are aware that in 1830 M. Braconnot announced the discovery of a crystalline substance, which he had succeeded in extracting from the leaves and bark of the aspen (*Populus tremula*, and which he called populine. A recent investigation of this substance has led me to the following results:—

After having unsuccessfully attempted to resolve populine by means of synaptase, I had recourse to other agents; and the reactions which I have observed have led me to regard this substance as a complex group, resulting from the union of benzoic acid,

saligenine. and grape-sugar into one molecule. The products of decomposition by the action of various reagents are precisely the same as those which would result from the metamorphosis of the secondary groups which it contains. Thus with a mixture of bichromate of potash and sulphuric acid, populine yields hydruret of salicyle very abundantly; on ebullition with concentrated nitric acid, it is converted into nitrobenzoic acid, trinitrated phenic acid and oxalic acid; lastly, under the influence of acids, it is decomposed into benzoic acid, saliretine and grape-sugar.

The elementary constitution of populine is represented by the formula $C^{40} H^{22} O^{16} + 4\,Aq$. At 212° it parts with its 4 equivs. water, and becomes perfectly anhydrous. This formula results from the union of equal equivalents of benzoic acid, saligenine and sugar, with elimination of 4 equivs. water, as seen by the following equation :—

$$C^{14} H^{6} O^{4} + C^{14} H^{8} O^{4} + C^{12} H^{12} O^{12} - 4HO = C^{40} H^{22} O^{16}.$$

We might also regard populine as the result of the union of a molecule of benzoic acid with a molecule of salicine less 2 equivs. of water; we should then have—

$$C^{26} H^{18} O^{14} + C^{14} H^{6} O^{4} - 2HO = C^{42} H^{22} O^{16}.$$

This mode of viewing its molecular constitution having led me to foresee the possibility of converting populine into salicine, I made some experiments in this direction, by which my suppositions have been realized with unexpected success. It is merely requisite to boil some populine with barytic water to obtain in a few minutes a perfectly limpid and colorless solution, which, after separation of the excess of baryta by a current of carbonic acid, contains nothing further than benzoate of baryta and salicine. The salicine thus prepared is decomposed, under the influence of synaptase and acids, like ordinary salicine, and behaves absolutely in the same manner towards other reagents. Two analyses of the artificial salicine gave the following numbers:

Carbon	54·20	54·65
Hydrogen	6·36	6·41

which are identical with those which had been obtained by the analyses of ordinary salicine.

If populine be dissolved in the cold in 10–12 times its weight of pure nitric acid of 1·30 spec. grav., it produces a new substance,

which I call benzohelicine. Benzohelicine is not decomposed by synaptase; but under the influence of acids and alkalies it is resolved into hydruret of salicyle, benzoic and grape-sugar. Consequently this substance stands in the same relation to helicine as populine to salicine; and it will perhaps be advisable to substitute the term benzosalicine for the word populine. Benzohelicine is converted into helicine when boiled with caustic magnesia, which removes from it the benzoic acid it contains, without altering the helicine.

Before concluding this letter, allow me to communicate another fact, which may prove interesting to some chemists; it is the existence of the homologue of acetone in the æthalic series. Æthalone is obtained with the greatest facility by distilling æthalic acid quickly with an excess of slaked lime. In order to purify it, it is crystallized several times from boiling alcohol; it separates in thin nacreous plates, which have the following composition :—

Carbon -	82·46	82·94	62 =	372	82·67
Hydrogen	13·94	14·04	62	62	13·73
Oxygen -	..	..	2	16	3·55

Chem. Gaz. March 1, 1852, *from Comptus Rendus.*

ON THE MANUFACTURE OF OXALIC ACID.

Oxalic acid is formed by the action of nitric acid on a great number of vegetable substances, such as sugar, rice, starch, washed sawdust, &c.

Sugar, either in its crystalline state or in that of molasses or treacle, is the substance more commonly employed in the manufacture of oxalic acid.

On the addition of nitric acid to the saccharine solution and exposure to heat, a substitution of part of the oxygen of the nitric acid for the hydrogen of the sugar is effected, oxalic acid being formed and deutoxide of nitrogen evolved from the liquor. Other changes than this however take place; carbonic acid is often disengaged with the deutoxide of nitrogen, and saccharic acid and other products remain in solution with the oxalic acid.

Instead of cane-sugar or treacle, the saccharine substance formed by the action of sulphuric acid on potato or other starch (as in Mr. Nyren's process) is employed. For this purpose the potatoes are well washed, and then reduced into a fine pulp by rasping, grinding, and other suitable means; such pulp is then washed two or three times by placing it in water and well stirring it therein, then permitting the pulp to subside, and running off the water. The pulp thus obtained is next placed in an open vessel of lead, or wood lined with lead, with as much water as will allow of the mixture being boiled freely by means of steam passed through leaden pipes placed therein. Into the mixture of pulp and water about 2 per cent. by weight (of the potatoes employed) of sulphuric acid is to be stirred in, which will be at the rate of from 8 to 10 per cent. of acid on the quantity of farina contained in the potatoes; the whole is now to be boiled for some hours until the pulp of the potatoes is converted into saccharine matter; the completion of this process being readily ascertained by applying a drop of tincture of iodine to a small quantity of boiling liquor placed on the surface of a piece of glass, when, if there be any farina remaining unconverted, a purple color will be produced. The saccharine product thus obtained is then filtered through a horse-hair cloth, after which it is carefully evaporated in any convenient vessel until a gallon of it weighs about 14 or 14½ lbs. It is now in a proper condition to be employed in the manufacture of oxalic acid, by the application of nitric acid, as in the case of operating upon sugar or treacle. Horse-chestnuts, deprived of their outer shells, are also applicable to the manufacture of oxalic acid when treated in the way above described for potatoes.

Instead of operating with sulphuric acid, the farina of potatoes and of chestnuts may be treated with diastase, and converted into a liquor similar to that obtained after evaporation from the farina and sulphuric acid before mentioned, using about the same proportion of diastase as above directed for sulphuric acid. In this case the liquor is made of the required strength at once, and the processes of filtration and evaporation are rendered unnecessary.

The apparatus required in the conversion of the saccharine matter (whether of cane-sugar or formed of starch in the way above mentioned) into oxalic acid is very simple. Usually, earthenware jars of about two gallons capacity, are employed, which, when

charged with nitric acid and the saccharine material used, are placed in water-baths capable of holding a hundred or more of these jars. These baths are constructed of brick and lined with lead, and are heated by means of steam passed through coils of lead pipe placed therein.

Instead of earthenware jars, vessels of lead, or of wood lined with lead, may be employed in the manufacture of oxalic acid. For this purpose, square open vessels, 8 feet square and 3 feet deep, are a convenient size, the liquor being heated by means of steam passed through a coil of lead pipe. A coil of about 48 feet of one-inch pipe, in a vessel of the size above mentioned, is sufficient to keep the liquor at the required temperature. In using these vessels, the liquor (whatever it may be) to be converted into oxalic acid is put into them, together with the acid employed, and heated until the required decomposition is effected. The liquor is then drawn off by a syphon, or by a cock placed at the bottom of the vessel, into shallow leaden vessels, or wooden vessels lined with lead, to cool and crystallize, and the mother-waters are drawn off from the crystals and used in the next operation.

When the manufacture of this acid is conducted in large vessels as above mentioned, the specific gravity of the nitric acid employed may be less than when the earthenware jars are used. From 1.200 to 1.270 are about the limits of the range allowed for the gravity of the acid. As regards the temperature of the baths, this should be maintained at or about 125° F. Whilst the operation is in progress, the active evolution of gas, without the appearance of red fumes, and the emission of a peculiar smell, slightly indicative of the presence of nitric oxide, are amongst the signs that everything is in good working condition. The judicious addition of sulphuric acid is found to contribute to an increase of the quantity of oxalic acid produced. The product of acid from a given quantity of sugar has been much understated by chemical writers; this has most probably arisen from the circumstance of boiling the sugar with strong nitric acid, by which means a large quantity of oxalic acid becomes converted, as soon as formed into carbonic acid; and the result is, that the actual product of oxalic acid obtained represents only about one-half of the sugar employed, and therefore not above one-half the quantity which should have been

obtained. Thus we find it stated, that from 50 to 60 lbs. of oxalic acid are obtainable from 100 lbs. of good sugar, whereas the quantity actually obtained in practice is from 125 to 130 lbs. Treacle of course gives a smaller product, 100 lbs. of fair quality yielding from 105 to 110 lbs. of oxalic acid.

The mother-liquor having been poured off, the crystals of acid obtained are thrown on drainers and washed, and then carefully dried in a suitable stove. The mother-liquors, when treated with a fresh supply of nitric acid and treacle, are ready for a further operation.

About 4¾ cwts. of nitrate of soda and 2½ cwts. of sulphuric acid are used to furnish the nitric acid required to convert 1 cwt. of good sugar into oxalic acid.

Mr. Jullion has patented a process for the conversion of formic acid into oxalic acid. For this purpose, formic acid is saturated with a solution of caustic potash, and then half the quantity of caustic potash required for saturation is added to the above mixture; the whole is then evaporated to dryness, and heated to 560° F. By this process, the formic acid is decomposed, and oxalate of potash formed. Caustic soda may also be employed instead of caustic potash.

The oxalate of potash or of soda thus obtained is then treated with sulphuret of barium, hydrate of baryta, or any soluble salt of baryta, whereby an oxalate of baryta is precipitated, from whence pure oxalic acid may be obtained by means of sulphuric acid.

Another mode of obtaining oxalic acid is by the process patented by Dr. Wilton Turner, who directs the uric acid obtained from guano to be treated with peroxide of lead or manganese suspended in water, at a boiling temperature, by which means it will be decomposed into oxalic acid, allantoin and urea. The oxalic acid forms an insoluble compound with the lead or manganese. The lead process is as follows:—A known weight of uric acid is placed in an open cylindrical iron vessel, capable of holding 2 lbs. of water for every pound of the acid, and adapted to boil by steam. A clear saturated solution of lime-water is then added, and as soon as it is heated and in brisk ebullition, the peroxide of lead is added in successive portions as long as it is observed to be whitened by the boiling liquid. The whitish powder thus obtained is oxalate

of lead. About 240 lbs. of peroxide of lead are required for each 168 lbs. of uric acid employed. The supernatant liquor is next drawn off, and the oxalate of lead washed with clear water; this is then boiled with dilute muriatic acid (equal parts of acid and water,) by means of which oxalic acid is obtained in solution, which is evaporated and crystallized, whilst muriate of lead remains as the precipitate.

The allantoin is also decomposed into oxalic acid and ammonia by boiling it with caustic alkali. The former unites with the alkali used, while the ammonia passes over, and may be collected as liquid ammonia; the oxalic acid thus generated may be obtained as oxalate of potash if potash be the alkali employed, or as oxalic acid if baryta be used, by decomposing the latter oxalate by means of sulphuric acid. In this case the oxalate of baryta may be treated in the way previously described for oxalate of lead.

As regards these various methods of obtaining oxalic acid, their employment will of course always be a question of £ *s.* *d.*, the economy of many operations of manufacturing chemistry being often dependent upon their adaptation to the requirements or purposes of particular manufacturers, in connection with other branches of manufacture carried on by them.

The low price at which treacle and sugar are now obtainable is much in favor of their use in this manufacture. The chief point however to which attention must be directed, in order to lessen the cost of production of this article, is in economizing the nitric acid used.

In speaking of the action of nitric acid upon sugar, it was observed that carbonic acid is produced, and that it passes off with the deutoxide of nitrogen also set at liberty. The presence of carbonic acid in this case proves a great obstacle in the reconversion of nitric oxide into nitric acid, preventing the union of the oxygen of the air with the nitric oxide. Various processes have been from time to time suggested to effect this economy in the manufacture of oxalic acid; amongst these the following may more particularly be noticed:—

In 1846, Mr. Jullion patented a method of converting the oxides of nitrogen, given off in the manufacture of oxalic acid, into nitrous and nitric acids. For this purpose he uses a "generating

vessel," which is a vessel something like a Woulf's bottle, only having a moveable top fitting air-tight, and capable of holding about 100 gallons. The materials to form the oxalic acid are introduced, and the vessel heated by a water-bath (by steam or other convenient means,) which surrounds the vessel; a quantity of nitric acid is then added, and air or oxygen is forced in through a pipe inserted in the top. The oxygen, coming in contact with the evolved oxides of nitrogen, immediately converts a portion into nitrous and hyponitrous acids, which are partly again absorbed by the fluid in the vessel; another portion passes off by a pipe inserted in the upper part of the vessel, which pipe passes through a furnace. This part in the furnace is a little enlarged, and is heated to from 600° to 900° F.; this part of the pipe or tube contains spongy platinum, or other similar substances. The gases, on coming in contact with the heated platinum, combine to form nitric acid, which is afterwards condensed in vessels arranged as usual in the manufacture of this acid. Instead of platinum, a close vessel containing water may be used, which decomposes hyponitrous and nitrous acids, giving rise to nitric acid. This principle is applied in the following ways:—The oxides of nitrogen, as evolved from the liquor in the decomposing vessel, coming in contact with oxygen, are converted into hyponitrous and nitrous acids, which, upon being mingled with steam, are decomposed into nitric acid and deutoxide of nitrogen; or the introduction of steam may be obviated by using heated air or oxygen in the decomposing vessels, by which means moisture will be furnished from the liquor; the amount of evaporation thus caused will also prevent an inconvenient increase of the mother-liquor. The compounds thus formed, when passed through suitable condensers, will, if the supply of atmospheric air or oxygen has been in excess, be all or nearly all condensed into nitric acid.

The following is a description of Crane and Jullion's continuous method of manufacturing oxalic acid and nitric acid at one process: The oxalic acid mother-liquor of a previous process is placed in a closed or covered vessel termed a "generator," formed of slate; nitric acid and syrup in the usual proportions employed for such quantity of mother-liquor, are also placed separately in feeding vessels, over the "generator;" heat is then applied to the mother-

liquor, and the temperature raised as quickly as possible to 180° or 200° F. Streams of nitric acid and syrup are then caused to flow into the generator by means of suitable stop-cocks and funnel-pipes, in such a quantity that the delivery of the whole shall occupy about eighteen hours, at the expiration of which time the process will be completed.

The gases arising from the decomposition of the materials so supplied pass off through an eduction-pipe in the top of the generator into a receiver, into which a stream of chlorine is introduced (from a chlorine-generator) sufficient to convert the whole of the oxides of nitrogen into nitric acid. A portion of the water in the receiver is decomposed, its oxygen combining with the oxide of nitrogen to form nitric acid, whilst its hydrogen combines with the chlorine to form hydrochloric acid. These mixed vapors pass over into suitable condensing vessels placed to receive them. The whole of the nitric acid and syrup having been run in, and the liberation of the gases or oxides of nitrogen having ceased, the oxalic acid liquor is drrawn off from the generator and crystallized.

Messrs. McDougall and Rawson have also patented a method of recovering the vapors which pass off in the manufacture of oxalic acid. To effect this, they direct the employment of a series of vessels containing water, into the first of which the nitrous gas or fumes are passed through a tube dipping below the surface of the vessel; air is also admitted, which mixes with the gas bubbling up through the water. Attached to the last vessel of the series is a pneumatic apparatus, by means of which the mixture of nitrous gas and air is drawn through this series of vessels, each containing a tube dipping into the liquid, and another tube or pipe attached to its top to connect it with the next vessel. The nitrous gas thus passing alternately into air and water, becomes converted into nitric acid. In this process the following reaction is said to take place:—

On $3NO^4$ being passed into water of the temperature of 100°F., or upwards, $2NO^5+NO^2$ result, the $2NO^5$, *i. e.* 2 atoms of nitric acid, remain in solution, whilst the NO^2, which is an incondensable gas, bubbles through the liquid and unites with the air in the vessel above the liquid; it immediately takes 2 atoms of oxygen

from the air and becomes NO^4, which, passing through the liquid, becomes nitric acid and nitrous gas as before; and thus nearly the whole the nitrous fumes or gas are reconverted into nitric acid.

In Ecarnot's patented process for recovering the nitric acid, he fills his regenerating vessels with a porous substance, such as pumice-stone, supplying the oxygen by a blowing-machine, a flow of steam being brought from a boiler.—*Chemical Gazette, March* 15, 1852.

APPLICATION OF ORGANIC CHEMISTRY TO PERFUMERY.

From a Letter written by Dr. Hofmann to Prof. Liebig.

The beautiful investigations of M. Cahours upon the oil of *Gualtheria procumbens*, which have made us acquainted with the nature of this compound, so much used in perfumery, appears not to have been lost sight of in the arts.

The arrangement of the oil of winter-green in the group of the compound ethers, could not do otherwise than direct the attention of the manufacturers of perfumery to this extensive class of bodies, the number of which is still further daily increased by the active energy devoted to the field of organic chemistry. The remarkable fruity odor of many of these ethers had not been overlooked by chemists; but it was reserved for practical men to make the selection and ascertain the proportions in which certain of these compounds resembled in so great a degree the aroma of particular fruits, that we almost feel ourselves led to the idea, that these very compounds are the cause of the odor of the fruits in question, and that they would be found in them, if the processes were followed on a sufficiently large scale.

The artificial production of aromatic oils for commercial purposes has only been carried on for the last few years; but although the process of fabrication is so new, yet it appears to be already in the hands of several distillers, some of whom make tolerably large quantities. The jury were enabled to satisfy themselves of this, in their examination of the products belonging to this depart-

ment in the exhibition. We found in our surveys at the Exhibition, both in the English and in the foreign divisions, a copious selection of the chemical articles of perfumery, the applicability of which was moreover illustrated by the simultaneous exposition of the confectionary flavored with them.

Unfortunately, most of these oils were only sent in small quantities, so that the specimens which I was enabled to obtain, in few cases only allowed of accurate examination.

The compound most frequently exhibited was a liquid labelled "*pear oil*," which on examination was shown to be an alcoholic solution of pure *acetate of amylic oxide*. As I had not enough of the compound to allow of its sufficient purification for ultimate analysis, I decomposed it with potash, when free fusel oil separated, and the acetic acid was determined in the form of the silver salt. The acetate of silver gave per cent.—

Theory.	Experiment.
64·68	64·55

The acetate of amylic oxide, when obtained by the ordinary process (1 part of sulphuric acid, 1 part of fusel oil, and 2 parts of acetate of potash), evolved a remarkably fruity odor; but the agreeable odor of the Jargonelle pear was not distinct until it was diluted with 6 vols. of alcohol. On close inquiry of the exhibitors, I ascertained that tolerably large quantities of this oil (in one case 15–20 lbs. weekly) are manufactured. It is principally used for flavoring pear-drops, which are much admired in England, and which consist almost entirely of barley-sugar.

Next came the *apple-oil*. As the examination shows, it is nothing more than the valerianate of amylic oxide, and every one is at once reminded of the insupportable odor of rotten apples, which fills the laboratory, in making valerianic acid. When the crude distillate of this operation is treated with dilute alkali, the valerianic acid is separated, and an ether is obtained, the solution of which in about 5 or 6 vols. of alcohol possesses a most agreeable aroma of apples.

The essence in greatest quantity was the *pine-apple oil*, which, as you are aware, is only the butyrate of ethyle. This compound, also, like the two above, does not evolve the agreeable odor until diluted with a large amount of alcohol. Butyric ether, which in

Germany is frequently added to the inferior kinds of rum, is principally used here for flavoring a kind of lemonade (pine-apple ale). For this purpose it is however seldom prepared from pure butyric acid, but generally by merely saponifying the butter, and distilling the soap with concentrated sulphuric acid and alcohol. The liquid thus obtained of course contains other ethers besides butyric ethers, but it may be used in this state for flavoring. The specimen which I analysed appeared however to be the pure ether prepared from butyric acid. When decomposed by potash and converted into a silver salt, it yielded—

Experiment.	Theory.
55·33	55·38 per cent. of silver.

The so-called *cognac oil* and *grape oil* were sent both by English, as also French and German exhibitors. They appear to be used pretty commonly for imparting the favorite cognac odor to low brandies. Unfortunately the specimens exhibited were too small in quantity to allow of my instituting an accurate examination of these oils. The cognac oil especially was in very small quantity; on the addition of water to the whole of the sample, a few drops only separated, and these consisted of a mixture. The grape oil is also an amyle compound, dissolved in much alcohol; for when treated with concentrated sulphuric acid, the oil, freed from alcohol by washing with water, yielded sulphate of amylic oxide, which was identified by the analysis of the barytic salt. It yielded 45·82 per cent. of sulphate of baryta.

The crystallized amylo-sulphate of baryta with 2 equivs. of water, analysed by Cahours, and again recently by Kekulé, contains 45·95 per cent. of sulphate of baryta. It is certainly remarkable, that we see here a body, which on account of its insupportable odor is separated from brandy with the greatest care, again applied in an altered form to flavor this beverage.

I must also allude to the *artificial oil of bitter almonds*. When Mitscherlich, in 1834, discovered nitrobenzole, he little thought, after twenty years, to find this body in an industrial exhibition. He certainly, at that time pointed out the remarkable resemblance which the odor of nitrobenzole had to that of oil of bitter almonds: but the only sources for obtaining benzole at that time, viz. the oil of compressed gas and the distillation of benzoic acid, were

much too expensive, and put an end to the idea of substituting the use of nitrobenzole for oil of bitter almonds. However, as you recollect, by means of the well-known aniline reaction, I showed with the utmost certainty the presence of benzole in the common light oils of coal tar, which had frequently been previously suspected; and in 1849, C. B. Mansfield showed, by a careful investigation, that benzole may be procured easily, and in large quantity, from oil of coal tar. In his memoir, which contains many valuable details upon the practical applications of benzole, the possibility that the fragrant nitrobenzole may be obtained in larger quantities is alluded to. As the Exhibition shows, this remark has not been lost sight of in the arts. Among the articles of French perfumery, with the title of *artificial oil of bitter almonds*, and the fanciful name of *essence of Mirbane*, there were several specimens of oils, which on accurate examination proved to consist of more or less pure nitrobenzole. I was not enabled to ascertain accurately the extent of this fabrication; but it appears to me by no means inconsiderable. Here, in London especially, tolerable quantities of this artificial oil of bitter almonds are prepared. The very simple apparatus used is that proposed by Mr. Mansfield. It consists of a large glass worm, the upper end of which branches into two tubes, which are provided with funnels. A stream of concentrated nitric acid flows slowly through one of these funnels, whilst the other is for the benzole (which for this purpose need not be absolutely pure). At the point at which the tubes of the funnels are united, two bodies come in contact; the chemical compound formed becomes sufficiently cooled in passing through the worm, and only requires to be washed with water, and finally with some weak solution of carbonate of soda, to be ready for use. Although the nitrobenzole closely resembles oil of bitter almonds in physical properties, it posesses however a somewhat different odor, readily recognised by a practised hand. However, it answers well for scenting soap, and would be extensively applicable for confectionary and for culinary purposes. For the latter purpose it has the special advantage over oil of bitter almonds, that it contains no prussic acid.

Besides these, several other similar products were exhibited, but most of them were of too compound a nature, and in too small a

quantity to allow of their composition being accurately determined. In the case of many of these essences, their resemblance to the aromas specified was very doubtful.

The application of organic chemistry to perfumery is still in its infancy; and we may expect that a careful survey of those ethers and etherial compounds with which we are at present acquainted, and those which are daily being discovered, will lead to further results. The interesting caprylic ethers, which M. Bouis has lately discovered, are remarkable from their extremely aromatic odor; (thus the acetate of caprylic oxide possesses an odor as strong as it is agreeable), and promise, if they can be obtained in larger quantities, to yield new materials for perfumery.—*London Chem. Gaz. March* 1, 1852, *from Ann. der Chem. und Pharm.*

ON THE STEARIC CANDLE MANUFACTURE.

By Mr. George F. Wilson, Managing Director of Price's Candle Company.

(*Read before the Society of Arts, Feb. 5th*, 1852.)

The science of candle-making is indebted for its existence to the eminent French chemist M. Chevruel, who in 1811 began his researches into the nature and constituents of fatty bodies. He discovered that fat, instead of being a simple organic substance, as had been previously believed, was a salt composed of a solid animal acid (margaric) and an animal base (glycerine,) the acid being the inflammable part. In 1814, he further discovered the existence of a liquid acid (oleic) existing in lard, and forming a chief ingredient in many fatty bodies. His researches were continued for several years, and in 1823 were given by him to the world in his well known work. He has recently been presented by the *Societe d'Encouragement* with a prize of 12,000 francs.

The first successful attempt to employ commercially these scientific discoveries of Chevruel was that of De Milly of Paris, who commenced manufacturing in 1832. His candles are stamped with the word "Etoile," from the Barriére de l'Etoile, near which his works are situated. De Milly employed a modification of Chevruel's process for separating the acids from the glycerine with which they are combined. Tallow is boiled up with thin cream

of lime, which causes the acids to forsake the glycerine and combine with the lime; the acids are then set free by combining the lime with sulphuric acid, and the oleic acid is afterwards separated from the margaric by simple pressure. This is the process of lime "saponification." A large cake of margaric acid, which had been shown by De Milly at the Exhibition, was exposed upon the lecture-table.

The obstacle to the success of this process was its expense, the margaric acid requiring nearly two and a half times its weight of tallow to produce it. This obstacle was overcome by the firm of which the lecturer is a member, who in 1830 became possessed of a patent for separating cocoa-nut oil into its solid and liquid parts. In 1831, the candle manufacture was freed from the excise, and received in consequence a great impulse. The success of candles made from cocoa-nut oil was however not great, owing to their requiring snuffing; but it was discovered by Mr. James Wilson, while endeavoring to make cheap candles for the illumination on the occasion of the Queen's marriage, that from a mixture of the cocoa-nut stearine with stearic (pure margaric) acid, candles were produced, which gave a beautiful light and wanted no snuffing. These are the well known "composite candles."

The next step was the purification of the fat acids by distillation; and the first suggestion of a method of doing this was made by Mr. George Gwynne, who proposed distilling in a vacuum apparatus similar to that used in sugar refining. He afterwards, in conjunction with Mr. George Wilson and Mr. Jones, carried out his idea into practice, by distilling in an atmosphere of steam, which gave the same results as the air pump, but without its manufacturing difficulties, which were found to be almost insuperable. The process at present employed on the works of the Company is briefly as follows:—The raw material (at present palm oil) is exposed at a temperature of 350° to the action of about one twentieth of its weight of sulphuric acid, which has the effect of driving off the glycerine, and of leaving the fat acids free; these acids, which are of a very dark color, after being washed, are transferred to a still, from which the air is excluded by steam. The distilled material is subjected to pressure, first at the ordinary, and then at a high temperature, and the residue is the material of which the Belmont sperm candles are made. The process of distillation was

commenced on a large scale at their works in 1844, two years before the opening of the factory of Messrs. Masse and Tribouillet, the first established for this purpose on the Continent. Arsenic and wax were originally used by Price and Company to destroy the large crystals which were formed in their earlier candles, and which disfigured their exterior; but by pouring the stearic acid into the moulds at its congealing point, instead of at a high temperature, it was found that the crystals were no longer formed. Six kinds of candles are made at the Belmont works:—1. Belmont sperm; of hot-pressed palm acid. 2. Belmont wax; the same material, but colored with gamboge (to suit the refined prejudices of the home consumers.) 3. Best composite; of the same material as 1 and 2, but mixed with cocoa-nut stearine. 4, 5 and 6. Composite 1, 2, 3, of inferior quality. The machinery for making the candles was shown and explained; and as an example of the very large scale of the operations of the Company, it was stated that 800 miles of wick are continually being converted into candles.—*London Chem. Gaz., from Literary Gaz.*

ON THE PRODUCTION OF CHLOROFORM FROM CHLORIDE OF LIME AND THE ESSENTIAL OIL OF TURPENTINE.

By J. Chautard.

On mixing intimately in a retort 600 parts of water, 200 parts of chloride of lime and 25 of oil of turpentine, and submitting the mixture to distillation, a violent reaction occurs, and at the same time a very agreeable etherial odor is manifested. A large quantity of carbonic acid gas is disengaged, which, as it causes the matter to froth, necessitates the employment of large vessels. On removing the retort from the fire as soon as the mixture begins to rise, the operation goes on well, and continues of itself to the end. The receiver contains three layers, frequently intermixed. The first consists of essential oil, which appears to have escaped the reaction; the lower one is an etherial liquid, with the odor of chloroform; the intermediate layer consists of water, holding in solu-

tion a considerable amount of the preceding product. The latter is separated by means of a pipette, and rectified on the water-bath; two or three treatments of chloride of calcium, and a few fractional distillations, suffice to render it perfectly pure.

This product presented all the properties and the composition of the chloroform of the methylic series. It is a perfectly colorless, highly mobile liquid, with a very sweet taste and a most agreeable odor, heavier than water, in which it dissolves perceptibly, communicating to it the two preceding properties; it boils at 145°·4 F. On analysis it furnished C 10·47, H 1·03, Cl 88·59; theory requires C 10·05, H 0·84, Cl 89·11.

The slight excess of carbon and hydrogen obtained must, I think, be attributed to a small quantity of carburet of hydrogen, which tenaciously accompanies the chloroform, and from which it might perhaps be freed by distillation over sulphuric acid. This would at the same time account for the few degrees of difference between the boiling point of the substance under consideration and that admitted for chloroform.

I have no doubt that, by modifying the above process, we shall succeed in obtaining chloroform at far less expense than by the method of preparation generally in use.—*London Chem. Gaz.*, Feb. 16, 1852, from *Comptes Rendus*, Dec. 15, 1851.

ON THE HEAVY OIL OF WINE.

By Edward N. Kent.

Having occasion to use a little of the officinal oil of wine, I applied to one of our wholesale Druggists, who furnished me with an article, which I found to be useless. On testing a sample, it *mixed with water* and produced a slight milkiness. It was evidently alcohol, containing a trace only of oil. The price of this was $4 per pound.

Samples were then obtained from all the wholesale Druggists from whom it could be procured, and each of these was proved to be equally worthless, as the results of the following tests will show.

The second sample, when agitated with water, separated into two portions, one of which was aqueous and the other ethereal. The latter exposed to the air, to separate the ether by spontaneous evaporation, left a residue which was completely *soluble* in water, and proved to be alcohol. The price of this mixture of alcohol and ether was $4.50 per pound.

The third sample when agitated with water, became slightly turbid, and was dissolved. It had a pale yellow color, ethereal odor, and the sp. gr. was .909. A portion of it exposed twelve hours to spontaneous evaporation in a graduated measure, lost one-eighth of its bulk, and on the application of a taper, burned with a *blue* flame. It is quite evident that this also was alcohol with a small portion of ether, and a trace of oil. The price of this was $4.50 per pound, and it was labelled "Ol. Aetherii." It bore also the name of the *importers*.

The fourth sample, when agitated with water, became slightly turbid, and dissolved. It was colorless, had an ethereal odor, and the sp. gr. was .844. This also burned with a *blue* flame. The price of this worthless article was $6.50 per pound. It was labelled "Ol. Vini Pur," and bore also the name of the *London* manufacturer.

It may be well to remark, that the officinal oil of wine, when agitated with water, separates and falls to the bottom, being heavier than water, whence its name. The sp. gr. of the pure oil is not less than 1.05, and it has a yellow color.

The labels on the third and fourth samples above mentioned, are alone not sufficient evidence to prove that they were *imported*, but, in addition to the label, I was informed that one of them *was recently imported*, and also that the manufacturing Chemists in this country do not make or sell the oil of wine. In view of this statement (if true) the question naturally arises: How did the above worthless articles pass the Custom House under the existing law for "the prevention of the importation of spurious and adulterated drugs?"

I have examined another sample which is not offered for sale as oil of wine, but as it has properties resembling more nearly the officinal oil than either of the four samples above mentioned, it might possibly be confounded with the oil of wine. This sample had an agreeable *vinous odor*, and a *yellow* color. When agitated

with water a considerable quantity of oil separated, which was *lighter* than water. A portion of the original oil, distilled in a glass retort with a thermometer passed through a cork, inserted into the tubulure, gave about half its bulk of a colorless liquid below 180° F., which proved to be alcohol containing a small quantity of acetic ether and œnanthic ether. The residue left in the retort had the properties of a mixture of œnanthic ether and œnanthic acid. The above article has been extensively used (in connection with acetic ether) for the manufacture of factitious brandy, and is sold for about $1.50 per ounce.

After having tested samples of all the different articles offered for sale under the name of "oil of wine" by the wholesale Druggists of New York, without being able to find either of them worthy of the name, I prepared a little for my own use, by the following process, which is that of the London Pharmacopœia :

2 lbs. oil of vitriol were carefully mixed with 1 lb. commercial alcohol, and distilled very slowly in a glass retort. The product consisted of two portions, the lightest of which was an ethereal solution of oil of wine measuring 6 oz. This was exposed to the air for twenty-four hours, to remove the ether by spontaneous evaporation. The residue, washed with a little dilute solution of potash and dried, was pure "Heavy Oil of Wine," and weighed half an ounce. The quantity obtained, though small, corresponds exactly with the proportion obtained by Hennel at the Apothecaries' Hall, London, viz : 17 oz. oil of wine from 34 lbs. alcohol, and 68 lbs. oil of vitriol.

By a simple calculation of the cost of manufacture, and expense of importation, it will be seen that pure oil of wine could not be imported and sold at the prices asked for the samples above mentioned. In making this calculation it will be necessary to observe that under the existing excise law the price of alcohol in England is much higher than in the United States, and is now, I am informed, from 17 to 18 shillings sterling per gallon. The following calculation (based on the results of Hennell's process) gives the cost of *pure* oil of wine, manufactured in England and imported into this country, at $35 per pound; but the spurious articles now sold for oil of wine, are offered at prices varying from $4 to $6.50 per pound.

34 lbs. alcohol (about 5 gallons) at 17 shillings sterling per gallon, - - - - - - - - -	$18 70
68 lbs. oil of vitriol, at 2½ cents per pound, - -	1 70
Labor, fire, packing, bottle, &c., - - -	1 50
Cost of 17 oz. oil, to the English manufacturer, -	$21 90
Or per pound,	
Cost of making 1 lb. pure oil in England, - -	$20 61
Manufacturer's profit, say 10 per cent., - -	2 06
Wholesale price in England, - - - -	$22 67
Duties paid by importer, 30 per cent., - -	6 80
Charges paid by importer, 10 per cent., - -	2 26
Cost of importation, - - - - - -	$31 73
Profit on importation, - - - - -	3 27
Wholesale price of the imported oil, - - -	$35 00

I regret that I have been unable to find the price of pure oil of wine quoted in the lists of any of the manufacturing chemists, but think it fair to infer that if the article is offered for sale, of English manufacture, at less than $2 per ounce, that impurity or adulteration may be suspected, and in this case I would recommend the following process for testing its purity.

Agitate a small portion of the oil in a test tube, with an equal measure of water. If it dissolves, reject the sample as impure, but if the mixture separates into two portions, after standing at rest for a few moments, put it on a paper filter, previously well moistened with water. The water in the mixture will pass through the moistened filter, leaving ether or oil upon it. If this is colorless or very pale yellow, it should be exposed a few hours to spontaneous evaporation, to ascertain if it contains oil. But if it is yellow and heavier than water, this portion may consist of oil of wine; this, however, should be verified by observing the odor and sp. gr. of the oil. By carefully operating upon a *known* quantity in the above manner, the *proportion* of alcohol or ether (if present) may be easily determined.

As the efficacy of Hoffman's Anodyne is due to the heavy oil of wine contained in it, and as the proportion of this oil to the other

constituents is small, it is particularly necessary that the oil should be pure. The high price of alcohol in England, and a defect in the directions formerly given for its preparation in the United States Dispensatory, are the probable causes of the absence of pure oil of wine in New York. In recent editions of the above work,* the defective proportions have been substituted by those of the London College, and there is now no reason why pure oil of wine should not be made in the United States, where alcohol is cheaper, probably, than in any other part of the world. I hope that our manufacturing chemists will turn their attention to this subject, and displace all worthless chemical and pharmaceutical preparations by such as will be useful to the public, and creditable to the manufacturers.—*N. Y. Journ. Pharm., March*, 1852.

[The United States Pharmacopœia directs two pints of alcohol (sp. g,. ·835) to be mixed with three pints of sulphuric acid (sp. gr. 1.845;) by weight rather better than 3.3 of the acid, to one part of alcohol, and gives 1·096 as the sp. gr. of the oil.—Ed. *N. Y. Journ. Pharm.*]

*The proportions of alcohol and sulphuric acid directed in the U. S. Pharm., are not taken from the Lond. Pharm., but are the suggestion of the revising committee, founded on experiment. The acid is in greater excess, which, by causing the boiling point to rise sooner above the ether producing temperature, increases the oily product and decreases that of the ether.—*Ed. Am. Journ. Pharm.*

ON GRECIAN SPONGES.

By M. Landerer, of Athens.

The sponge trade forms no unimportant branch of Grecian commerce, the annual export being 150,000 litres. The principal divers are Hydriots, Spezziots, and Candiots; these occupy themselves especially in this branch of business. Yet more skillful divers are the Calimniots and the Simiots, inhabitants of the little Turkish islands, Calimnos and Simi.

The sponge fishery begins in May. At that time, from thirty to fifty little vessels, with red-brown sails, may be seen at once on the waters of the Grecian Archipelago, gliding among the

islands, seeking sponges. For the purpose of more easily distinguishing the sponges at the bottom, they have a dish containing fine sand and oil thoroughly mixed; a portion of this being scattered upon the sea, spreads itself around, and forms a layer of extreme tenuity upon the surface, by which the transparency of the water is much increased; they are now able to discern the bottom, which before was quite impossible. The naked diver, begirt with a strap, in which is placed a large and strong knife, now takes his place at the side of the vessel; as soon as he espies a sponge, he dives to the bottom, cuts it loose, and holding it in his hand, reappears upon the mirror-like surface of the sea, and resumes his station.

The sponges so obtained, are carried to some low and sandy beach, and there submitted to a cleansing and assorting process, in the following manner: Since they are covered, in the fresh state, with a slimy mass, they are first rubbed with fine sand, strung upon cords, and then subjected to the action of the sea, so that the movement of the water may separate as much as possible of the slimy matter, and the sponges in this way be cleansed. Afterward, when they have been exposed a long time in the sun, and frequently wet during that period with sea-water, they become whiter, and much improved in texture, while the gelatinous matter changes in its character, and by rubbing with sand is readily removed.

Thus prepared, they are assorted according to size and quality, strung upon cords, sprinkled with water, and, as they are sold by weight, well charged with sand. If our information be correct, it is worthy of note, that the slimy envelope being full of ovules, a crop of sponges is produced wherever it becomes stationary. It is also said that the divers who endeavor to tear the sponges loose with their hands, frequently experience a burning sensation throughout the entire arm.—*Central Blatt of April 7th*, 1852, *from Arch. der Pharm.*

ON A PROCESS FOR DETECTING THE PRESENCE OF WATER IN VARIOUS SUBSTANCES.

By A. Gorgue.

The presence of water in the alcohols and ethers may readily be detected by taking advantage of the property they possess of rendering benzine turbid when they contain water.

The only condition requisite for ascertaining the presence of water in a liquid is, that it must be soluble in the benzine. The following is the plan of operating, for instance, with alcohol:—It suffices to pour *one single drop* into 3–4 cub. centims. of benzine. If the drop falls to the bottom of the tube in which the experiment is made without producing any turbidity, the alcohol contains more than a third of its weight of water. To be convinced that the alcohol contains too much water for any opakeness to be produced, it suffices to add some absolute alcohol to a small quantity of the liquid, and to repeat the experiment. Every time that there is a production of turbidness, accompanied with the formation of little globules, we may be certain that the strength of the alcohol will be comprised between 65 and 93 centesimal degrees. If but a cloudiness be produced, the liquid contains at the most seven-hundreths of water. In this case the opacity may be made to disappear by the addition of some stronger alcohol. The experiment is made with benzine saturated with water, in little short dry tubes closed at one end, and of about 12 millims. in diameter.

When an ether is to be examined, essential oil of turpentine is preferable to benzine, as the turbidness produced is more persistent. It is not employed to detect the water in the alcohols, from its being less sensitive than benzine; in fact, an alcohol of 98° no longer renders it turbid.

By operating as I have stated, from seven- to eight-thousandths of water can be readily detected in an alcohol, and from three- to four-thousandths in an ether.

Any substance soluble both in the liquid under examination (alcohol, ether, &c.) and in the test for water (benzine, essential oil of turpentine, &c.) does not affect the sensitiveness of the process, which however is impracticable whenever one of the first liquids holds in solution a substance insoluble in the latter.

The property which hydrated ether possesses of rendering the oil of turpentine opake, may be applied to determine the hygrometric water in salts. It suffices to leave them in contact for a few minutes with anhydrous ether, and then ascertain whether it renders turpentine turbid. This mode of operating cannot be adopted in the case of substances insoluble in the turpentine which dissolve in the ether, or of salts which are dehydrated by the latter liquid, for instance, very efflorescent salts, such as the crystallized phosphate, carbonate and sulphate of soda. The process may be applied for detecting the presence of interstitial water in the slightly efflorescent crystalline salts, as the sulphate of copper and the sulphate of manganese, and those which are unaltered by exposure to the air, as the chloride of barium, the oxalate of ammonia, &c. Ether is preferable to alcohol in these experiments, because a smaller proportion of water can be discovered in it; and, moreover, the latter liquid dissolves, and dehydrates a larger number of salts than ether.

Taking advantage of the insolubility of water in benzine, I have been able to preserve intact, crystals of deliquescent salts, as those of the chloride of calcium and bichloride of copper; efflorescent salts, as the phosphate, sulphate and carbonate of soda; and lastly, crystals of salts which become oxidized in the air in the course of time, as the protosulphate of iron. To preserve these substances in benzine, it is only requisite that they should have been well dried on blotting paper, or wiped with a piece of fine linen. Crystals which had been kept in benzine lost all smell after they had been submitted for a short time to a somewhat brisk current of air, and had experienced no alteration in their composition or properties.—*London Chem. Gaz., Feb.* 16, 1852, *from Comptes Rendus, Dec.* 22, 1851.

ON THREE KINDS OF QUININE.

By J. Van Heijningen.

If common pure quinine be dissolved in absolute alcohol and the latter allowed to evaporate spontaneously, a resinous mass remains behind, in which acicular crystals are contained. If it be dissolved

in ether, there also remains after the evaporation a resinous substance, but in which these crystals cannot be discovered.

According to Martiny and Liebig, common quinine is obtained in crystals from an ammonical liquid. These are most easily procured when ammonia in excess is added to a solution of the neutral sulphate of *a* quinine, and of the sulphate of quinine with three atoms of water, and the mixure set aside. After some time very fine acicular crystals appear on the surface, which can be isolated only with difficulty, and when washed and dried form an amorphous powder. But from absolute alcohol these crystals no more crystallize than does amorphous quinine.

If, however, recently-precipitated quinine, after having been carefully washed and repeatedly moistened, be spread out as thinly as possible and exposed to the air, the amorphous precipitate is gradually converted into crystals, which can be as easily recrystallized from absolute alcohol as quinine.

This amorphous precipitate, however, which is the third hydrate of quinine, loses during crystallization two equivalents of water, and possesses now, like the first hydrate of quinine, the property of being much less soluble in spirit of wine, and of crystallizing out of the hot alcoholic solution by cooling. This quinine recrystallized from alcohol and procured, as described above, by precipitation from the common sulphate of quinine by ammonia, loses, when moistened with ammonia, and exposed for a few days to the air at 130° Cent., five per cent of water.

Quinine . .	94.935 . .	1=2025.0	94.8
Water . .	5.065 . .	1= 112.5	5.2
	100.000	2137.5	100.0

It follows, therefore, that there are three kinds of quinine which are quite distinct the one from the other, and show their peculiarity also in their salts, namely—

a quinine, which loses at 130° C., 14.3 per cent. water = 3 eq.
β quinine, which loses at 130° C., 10.8 per cent. water = 2 eq.
γ quinine, which loses at 130° C., 5.2 per cent. water = 1 eq.

The *γ* quinine forms like the *a* and *β* quinine, basic and neutral salts, which easily crystallize, and have much similarity with those of *β* quinine. The basic sulphate of this alkaloid contains much

less water than the corresponding salt of the *a* and *β* quinine. Analysis showed

γ quinine . . .	84.78 =	4050.0 . .	84.81
Sulphuric acid .	10.75 =	500.0 . .	10.47
Water	4.47 =	112.4 . .	4.71
	100.00	4662.5	100.00

The proportion of water in the corresponding sulphate of *a* quinine, is 14 per cent., or seven equivalents; that of *β* quinine, 12.9 per cent., or six equivalents; and that of *γ* quinine, 4.70 per cent., or one equivalent.

The *γ* quinine is easily prepared, and of importance for the purification of the *a* quinine, as it crystallizes, and can, therefore, be more easily purified.

It establishes, moreover, the presence of the *β* quinine beyond doubt, since it is now quite certain that all three arise from one another. For the sake of greater order, the denomination ought now to be altered, and *a* quinine should be called that with one atom of water; *β* quinine that with two atoms; and *γ* quinine that with three atoms of water.—*London Pharm. Jour. May 1st, from Pharm. Central Blatt.*

QUINIDINE.

By Mr. Robert Howard.

This alkaloid, which gained a prize in the Great Exhibition, has scarcely yet attracted much attention. Some of the cheaper barks now largely imported from New Grenada contain so much of it that it is, perhaps, as well that it should be more studied. The *Cinchona cordifolia*, from that part of the continent, is particularly rich in it. It is, however, contained in larger or smaller quantities in the Bolivian and Peruvian barks—the *Cinchona Calisaya*, *Boliviana*, *rufinervis*, and especially *ovata*.

The sulphate of quinidine, or *β* quinine as it is called by some (Van Heijningen and others,) is so like the sulphate of quinine, that the eye or the taste can with difficulty distinguish them. It

forms the same light fibrous crystallization, and occupies as large a bulk. It corresponds in appearance with the description given by Winckler, of "chinidine." (See *Pharm. Journ.* for April, 1845, vol. iv. p. 468.) He notices that it has "a remarkably white color and a peculiarly faint lustre." Its most striking characteristic is its extreme solubility. Pure sulphate of quinine requires nearly thirty times it weight of boiling water for solution, whilst the sulphate of quinidine dissolves in four parts. On the other hand the pure alkaloid crystallizes readily out of proof spirit and out of ether, whilst quinine does not crystallize out of either. A very good test for the presence of cinchonine in sulphate of quinine is also capable of being applied to detect the presence of β quinine. On this point I would refer for very interesting details to a paper by M. Guibourt, in the *Journal de Pharmacie* for January in this year.

In your Journal for April, 1843, I gave a test for sulphate of quinine, to which I would again advert, because subsequent experience has proved it to be a tolerably easy, and at the same time exact means of ascertaining its purity. Put 100 grains in a Florence flask with five ounces of distilled water, heat this to brisk ebullition; the sulphate of quinine ought not to be entirely dissolved; add two ounces more water, and again heat it to ebullition; ought to make a perfectly clear solution. If this be allowed to cool for six hours, and the crystals carefully dried in the open air on blotting paper, they will be found to weigh about ninety grains, the mother-liquor may be evaporated and tested with ether, when any cinchonine or β quinine will be easily detected. On examining sulphate of quinine of commerce from several leading manufacturers, I have found all of them give, within a grain or two, the same result, and, in each, indications of β quinine, though to an unimportant extent.

The above quantity of water (seven ounces) readily dissolves 800 grains of sulphate of β quinine; and if 100 grains of this salt are dissolved in seven ounces of water, the crystals dried as above weigh only fifty-four grains, thus leaving forty-six grains in solution instead of about ten grains.

The medicinal effects of β quinine deserve investigation, the chemical constitution and the taste appear to indicate a great similarity if not identity.—*Lond. Pharm. Journ.*, *May*, 1852.

ON THE ADULTERATIONS OF SULPHATE OF QUININE, AND THE MEANS OF DETECTION.

Mr. Zimmer, manufacturer of sulphate of quinine in Frankfort-on-the-Maine, has published the following circular and paper to his Correspondents abroad :—

Frankfort-on-the-Maine, Feb. 6th, 1852.

You are, doubtless, aware that various and partly spurious kinds of sulphate of quinine have for some time past found their way into the market. The substance now frequently mixed with quinine is quinidine. But little positive is yet known of the medicinal properties of this alkaloid, and whatever may be the result of future experiments, its arbitrary substitution is, under any circumstances, unwarrantable, and renders a fair and honest competition almost impossible.

The importance of the subject has induced me to address a few words to you, that I may submit a simple experiment by means of which the most usual adulterations of quinine may readily be detected. I have the honor to be, with much respect, &c.,

C. Zimmer.

The high price of the genuine Bolivian *Cinchona Calisaya*, through the monopoly of its export, has given occasion to imports, from other districts, of *Cinchonas*, the quality of which widely differs from that of the Calisaya, inasmuch as they contain principally quinidine. The lower prices of these barks, regardless of their different constituents, have brought them quickly into use in many manufactories of quinine, whereby a large quantity of quinine containing quinidine, has got into the market, causing an undue depreciation in the price of quinine.

The existence of this third chichona-alkaloid is now established without a doubt by ultimate analysis, by the peculiarity of its salts, and by important distinctive tests; and there can be no further question, that quinidine must, equally with cinchonine, be distinguished from quinine. The external characters of sulphate of quinidine differ from those of sulphate of quinine; it has a greater specific gravity and less flocculent crystallization. In dry warm air it parts with its water of crystallization, without deliquescing

or losing its crystallized aspect; lastly, it is far more soluble than sulphate of quinine in cold water and in alcohol.

One of the distinctive properties of the three alkaloids in question, *viz.*, their behaviour with ether—places in our hands a ready means of detecting the mixture of cinchonine and quinidine, with quinine. Schweitzer (*Lond. Med. Gazette*, vol. xxi., p. 175) has already employed ether for the detection of cinchonine with complete success, and his process has, with justice, been subsequently quoted in most manuals, as it answers its purpose completely; cinchonine is known to be entirely insoluble in ether, whatever may be the quantity of the ether employed. The solubility of quinidine in ether, as compared with that of quinine, is but slight: ten grains of pure sulphate of quinine dissolve in sixty drops of ether, and twenty drops of spirit of ammonia, while only one grain of sulphate of quinidine is soluble in the same quantity of the fluid; and in proportion, quinine containing quinidine will always be less soluble than pure sulphate of quinine.

Guided by this fact I can recommend the following simple and very convenient process for the detection of quinidine and cinchonine:—

Ten grains of the salt to be examined is to be put into a strong test tube, furnished with a tight-fitting cork; to this are to be added ten drops of diluted sulphuric acid (one acid and five water) with fifteen drops of water, and a gentle heat applied to accelerate the solution. This having been effected, and the solution entirely cooled, sixty drops of officinal sulphuric ether with twenty drops of spirits of ammonia, must be added, and the whole well shaken, while the top is closed by the thumb. The tube is then to be closely stopped and shaken gently from time to time, so that the bubbles of air may more readily enter the layer of ether.

If the salt examined be free from cinchonine and quinidine, or contain the latter in no greater proportion than ten per cent., it will be completely dissolved; while on the surface, where contact of the two layers of clear fluid takes place, the mechanical impurities only will be separated (in which respect the various sorts of commercial quinine differ.) After some time longer the layer of ether becomes hard and gelatinous, after which no further observation is possible.

From the above statement respecting the solubility of quinidine

in ether, it appears that the ten grains of the salt to be examined may contain one grain of quinidine, and still a complete solution with ether and ammonia may follow; but in this case the quinidine will shortly begin to crystallize in the layer of ether. The last trace of quinidine may be yet more definitively detected by employing, instead of the ordinary ether, some ether previously saturated with quinidine, by which means all of the quinidine contained in the quinine must remain undissolved. It is particularly requisite in performing this last experiment to observe, after the shaking, whether all has dissolved, for owing to the great tendency of quinidine to crystallization, it may become again separated in a crystalline form, and be a source of error.

If more than a tenth of quinidine or cinchonine be present, there will be found an insoluble precipitate at the limits of the two layers of fluids. If this be quinidine, it will be dissolved on the addition of proportionately more ether, while cinchonine will be unaffected.

It is expressly to be remarked, that the necessity for testing sulphate of quinine in search of other fraudulent adulterations is not superceded by the above described process.

We have particularly to determine upon the absence of inorganic substances, which may be effected by red heat on a platinum dish, or simply by solution in alcohol. Gypsum, chalk, magnesia, &c., will be left undissolved. Boracic acid will be dissolved by alcohol, but its green flame will indicate its presence in the alcoholic solution when ignited.

The absence of organic substances, such as salicine, sugar, stearic-acid, &c., may be inferred from the formation of a colorless solution with pure concentrated cold sulphuric acid: it is as well to leave the sulphuric acid to act for some hours.

The presence of sal-ammoniac may be detected by the addition of caustic potash to the suspected salt, when, if present, it will be known by the diffusion of the ammoniacal odor.—*London Pharm. Jour. March*, 1852.

Varieties.

Glycerin Paste.—We are indebted to Dr. PAUL B. GODDARD for the following recipe for making a very adhesive paste, suitable for fixing paper to glass and other surfaces, and which keeps well, viz:

Take of Gum arabic, an ounce.
" Boiling water, two fluid ounces.
" Glycerin, two fluid drachms.

Dissolve the gum in the water, add the glycerin, and strain if necessary.

On the Manufacture of Drying Linseed Oil without Heat. By Baron LIEBIG.—When linseed oil is carefully agitated with vinegar of lead (tribasic acetate of lead) and the mixture allowed to clear by settling, a copious white cloudy precipitate forms, containing oxide of lead, whilst the raw oil is converted into a drying oil of a pale straw color, forming an excellent varnish, which, when applied in thin layers, dries perfectly in twenty-four hours. It contains from four to five per cent. of oxide of lead in solution. The following proportions appear to be the most advantageous for its preparation:

In a bottle containing four and a half pints of rain water, eighteen ounces of neutral acetate of lead are placed, and when the solution is complete, eighteen ounces of litharge in a very fine powder are added; the whole is then allowed to stand in a moderately warm place, frequently agitating it to assist the solution of the litharge. This solution may be considered as complete when no more small scales are apparent. The deposit of a shining white color (sexbasic acetate of lead) may be separated by filtration. This conversion of the neutral acetate of lead into vinegar of lead, by means of litharge and water, is effected in about a quarter of an hour if the mixture be heated to ebullition, When heat is not applied, the process will usually take three or four days. The solution of vinegar of lead, or tribasic acetate of lead thus formed, is sufficient for the preparation of twenty-two pounds of drying oil. For this purpose, the solution is diluted with an equal volume of rain water, and to it is gradually added, with constant agitation, twenty-two pounds of oil, with which eighteen ounces of litharge have previously been mixed.

When the points of contact between the lead solution and the oil have been frequently renewed by agitation of the mixture three or four times a

day, and the mixture allowed to settle in a warm place, the limped straw-colored oil rises to the surface, leaving a copious white deposit. The watery solution, rendered clear by filtration, contains intact all the acetate of lead at first employed, and may be used in the next operation, after the addition to it as before, of eighteen ounces of litharge.

By filtration through paper or cotton, the oil may be obtained as limpid as water, and by exposure to the light of the sun it may also be bleached.

Should a drying oil be required absolutely free from lead, it may be obtained by the addition of dilute sulphuric acid to the above, when, on being allowed to stand, a deposit of sulphate of lead will take place, and the clear oil may be obtained free from all trace of lead.—*London Pharm. Journ.* April, 1852.

On the State in which Oxygen exists in the Blood. By Baron Liebig.—According to the opinions of some Chemists oxygen is not chemically combined with, but is merely absorbed by, the blood, and in proof of this opinion the fact is cited that the absorbed oxygen can be expelled by carbonic acid. This inference is, however, according to the author, incorrect, and for the following reasons:—1000 volumes of water shaken with air and completely saturated therewith, absorb, according to Gay Lussac, only 9¼ volumes of oxygen and 18¼ volumes of nitrogen gas, while, according to the experiments of Magnus, 1000 volumes of blood will appropriate from 100 to 130 volumes of oxygen, and from 17 to 33 volumes of nitrogen. If the absorbed oxygen be contained only in one part of that fluid, that must be its water, which it is known under the same conditions absorbs from 11 to 14 times less oygen; the greater activity of its absorption by blood must be owing to some definite element which has a stronger affinity for oxygen than water possesses.

If the attractive power which the blood exercises towards oxygen be but slight, it does not thence follow that it is not chemically united. On the contrary, it is well known that the presence of one per cent. of phosphate of soda in water doubles its power of absorbing carbonic acid, over that of pure water at the ordinary atmospheric pressure. Solution of sulphate of iron will absorb forty times as much nitrogen as pure water can. Both of these solutions lose their gaseous contents in a vacuum, the former also by agitation with air, the latter by shaking with carbonic acid. It is hence obvious, and the conclusion applies to the blood, that absorption is greater in water holding salts in solution than in water alone.

A fluid then may be in two conditions, on either of which its absorbent power over gases may be dependent, viz., under pressure which condenses the gas, or chemical affinity exerted by its elements upon the gas.

If the oxygen of the blood were simply absorbed, then it must take up from the air, which contains only one-fifth of oxygen, twelve per cent. of

oxygen; double that proportion under twice the ordinary pressure; treble, under three-fold pressure; and if shaken with pure oxygen, it must receive five times as much. It has not yet been proved that the absorbent power of the blood varies with the alteration of atmospheric pressure. The researches of Regnault and Reiset have demonstrated that in the neighborhood of the Lake of Titicaco, in Puno (South Peru,) 12,000 feet above the sea, 15,000 persons—and at Potosi, in Bolivia, at a height of 12,600 feet, 30,000 persons live and breathe as well as those who reside on the sea-shore. Now, if the oxygen were merely absorbed by the blood, considerable influence must be exercised by the great differences in the amount of oxygen taken up.—*Ibid*, from *Chimisch-Pharmaceutisches, Central-Blatt*, December, 1851.

Adulteration of Borax.—We understand that there is at the present time in the market a quantity of adulterated borax, sold by a house at Wolverhampton, to which we think it right to call the attention of the trade. It contains twenty per cent. of *phosphate of soda*, which may be separated by exposing the sample to the heat of a drying-room for a few hours, when the phosphate effloresces and may be *picked* out—amounting to one-fifth of the whole. As a corroborative proof, solution of nitrate of silver may be added to a very dilute solution of 150 grains of the adulterated article, and then from the precipitated phosphate of silver the phosphate of soda may be calculated, which will equal 19·5 grains. This test is not perfectly accurate on several accounts, but affords a near approximation.—*Ibid.*

On the Scherbets of the East. By Dr. Landerer.—As the prohibition of wine imposed upon Mahommedans by the Koran, has induced the use of opium as a means of producing intoxication, so it may have probably been the cause of the invention of those beverages so generally employed in the East, *Scherbet* and *Bosa*.

The Eastern scherbets usually consist of water in which jelly or syrup made from fruit have been dissolved, or of an infusion in water of the fruit itself; and their composition varies according to the facility with which any fruit can be obtained. In Egypt, a scherbet is prepared from the roots of *Cyperus esculentus*, which are brought to Cairo and Alexandria in considerable abundance, and sold in the bazaars combined with rice, in the form of cakes. The Egyptians also use a scherbet made with honey. Various ingredients, as vanilla, otto of rose, peppermint, vinegar, and even mastich, are used to impart a flavor to scherbet, while an agreeable color is obtained by the employment of cochineal, the juice of the berries of *Phytolacca decandra* or of *cornus mas*, the latter an esteemed fruit in Asia Minor. One of the chief requisites for the scherbet is *cold* water, which, in the absence of ice, is obtained by the use of a porous earthen vessel, like the unglazed water-bottle or Alcarraza of the Spaniards.

The beverage called *Bosa* is a sort of acidulated, and sometimes fermented, scherbet. In its commonest form, it is made by fermenting an infusion of millet seed, and in this state probably represents the barley-wine, Οινος κριθης of the ancients. A more agreeable Bosa is prepared by the Egyptians from tamarinds and honey, and by the Greeks from the fruit of the love-apple (*Solanum Lycopersicum*) the latter beverage being called Δροσιστικον.

The manufacture of these drinks gives employment to a vast number of persons called *Scherbetzides*, the peculiar sound of whose little bells, struck by a machine, which at the same time cools their glasses by a stream of water, may be heard far and near through the streets of an eastern town, inviting customers to their trays, on which syrups, fruit, and sweetmeats are displayed.—*Lon. Pharm. Journ.*, March, 1852.

On Spurious Rhatany Root. By Prof. METTENHEIMER, of Giessen.—The root of the *Krameria triandra*, *R.* and *P.*, is one of the exotic drugs, which, generally speaking, is but seldom adulterated. Once lately, the author has found it adulterated by the *Radix Calagulæ*, an underground root of the Polypodium, growing in Peru, and seldom met with in the German trade. It differs both in chemical and physical characters from rhatany root. The root of the *Krameria Ixinia*, L., more closely resembles, and has more frequently been substituted for the genuine rhatany. During the year the author has several times met with spurious rhatany root, the source of which is altogether unknown to him. It has generally a thickness of one or two inches, and a length of four inches in its principal pieces, or of twelve inches in the secondary twigs, the average being about half an inch in thickness. Compared with the true rhatany, its twigs are smoother and slightly shining, having also deeper furrows and transverse depressions, of an annular form. It has, moreover, as sometimes seen on the true rhatany, wart-like projections, and the twigs and stems have a somewhat undulatory contour. The false rhatany is not so tough, and breaks more easily, with a short fracture. When viewed in bulk, it has a dirty violet red-brown color. Its bark is thicker and more firmly adherent to the wood; on its inner surface, the bark is lighter colored, and, when cut with a sharp knife, has a glistening aspect. The centre, when cut through, is of a dull, pale-red color, and without the dark points generally met with in true rhatany root. The false root has no odour; its taste is more strongly astringent than rhatany root. With chemical reagents, the false root gives generally more abundant precipitates than the true root.—*Ibid*, from *Jahrbuch fur praktische Pharmacie*, Oct., and Nov., 1851.

Cork Stoppers with Wooden Tops.—Dr. PEREIRA called the attention of the Members of the Pharmaceutical Society to the very convenient com-

pound stoppers in use in Germany and other places. His attention had been especially drawn to them, partly in consequence of having recently received several pharmaceutical substances from Germany, contained in bottles closed with these stoppers; and partly in consequence of having observed that many of the vegetable and other substances, sent from British Guiana to the Great Exhibition (most of which have been presented to the Pharmaceutical Society,) were preserved in bottles closed by this kind of stopper.

These stoppers consist of an accurately turned cork, or bung, surmounted by a flat wooden disk, or top, glued to it. This top is either round or polygonal; and may be either colored or covered by paper. It projects beyond the circumference of the cork, and serves as a handle. Its upper surface being flat, is useful for inscribing either the name of the article contained in the bottle; or, when the bottle is used in dispensing, the directions for the use of the medicine.

These stoppers are very convenient for closing bottles and jars used in museums, for preserving dry objects of natural history; as fruits, seeds, leaves, &c. They are much lighter than glass stoppers, and are not liable to get fixed, as they may be removed with the greatest facility. Moreover, bottles closed by them may be placed sideways in a drawer, without incurring the danger of the stoppers falling out.

To the Pharmaceutist, they cannot but be useful and convenient, for the preservation of powders and other dry substances; as well also for dispensing. Small bottles, closed with these stoppers, may be employed as substitutes for pill-boxes.—*London Pharm. Journ.*, Jan. 1852.

Disinfecting Property of Chloroform.—Dr. Auguna, of Constantinople, in a Memoir (sopra una nuova proprieta del chloroformio,) establishes the excellence of chloroform as a disinfecting agent, and shows, by reference to some highly interesting experiments, how this, its newly discovered virtue, distinguishes chloroform from the older anæsthetic sulphuric ether. Taking three wide-mouthed and thoroughly clean bottles, Dr. Auguna placed in one a small quantity of chloroform, and in another a small quantity of sulphuric ether; while into both he introduced a piece of the muscle of an ox. The muscle was placed in the third bottle, but no fluid was added; the three were then accurately closed. It was soon observed that the color of the flesh in the bottle containing chloroform changed from a deep red, its original hue, to a vermilion shade, but that the muscle in the bottle containing ether remained unchanged. At the termination of a week, the effect was still more clearly displayed; while the flesh in the bottle of air remained unaltered, that in contact with the chloroform had assumed the appearance of cooked meat. Upon opening the bottles, the flesh in the ether, and that in the air, exhaled a most offensive odor, and was itself far advanced in putrefaction. Not so that preserved in chloro-

form; it remained still undecayed, and possessed no smell save that peculiar to this fluid. It is not only over flesh, but over fruits and seeds, that Dr. Auguna has found chloroform to possess an antiseptic property. Dr. Auguna estimates that 1-200th of chloroform is sufficient to oppose the putrefaction of a piece of fresh muscular fibre.—*Boston Medical and Surgical Journal*, from *Gazetta Medica Italiana*.

Jatropha Urens.—The most deadly plant ever possessed at Kew, the jatropha urens, is no longer to be found there; it has either been killed off like a mad dog, or starved to death in isolation like a leper. Its possession nearly cost one valuable life, that of Mr. Smith, the present respected curator. Some five and twenty years ago, he was reaching over the jatropha, when its fine bristly stings touched his wrist. The first sensation was a numbness and swelling of the lips; the action of the poison was on the heart; circulation was stopped, and Mr. Smith soon fell, unconscious; the last thing he remembered being cries of "Run for the doctor." Either the doctor was skilful, or the dose of poison injected not quite, though nearly enough; but afterwards the man in whose house it was, got it shoved up in a corner, and would not come within arm's length of it. He watered the diabolical plant with an indefinitely long spout. If the vase itself contained a *quid pro quo*, he is not to be greatly blamed. Another not much less fearful species of *jatropha* has appeared at Kew and *disappeared*.—*Amer. Jour. of Med. Science*, April, 1852, from *Kew Gardens Quarterly Review*, December, 1851.

Elimination of Poisons.—M. F. Orfila, the professor's nephew, has read a paper before the Academy of Sciences of Paris, on the above subject. He states that a great number of poisons, after being absorbed, mix with the products of the various secretions, as urine, perspiration, saliva, gastro-intestinal fluids. All poisons do not pass into these secretions, but the majority of them may be discovered in the urine. It is rather a remarkable fact that arsenic and iodine do not pass into the bile. These are the only substances which have hitherto been sought in that secretion; it is, however, probable, that the same results will be obtained when other poisons are thus tried. Noxious principles are gradually expelled from the body in the manner above described—some in a short time, as arsenic and mercury; but others may be detected in the substance of the viscera, four, five, and even eight months after their introduction. The more the urine carries off a poison, the sooner will the latter be expelled from the economy. Arsenic and mercury pass into the urine so early as the seventh day after their introduction into the system, and they are quite expelled in a few days. Lead and copper are not detected in the urine, and the entire expulsion of these metals does not take place for eight months.

When a poison is absorbed, very good services may be rendered by the use of diuretics, purgatives, and diaphoretics. Still, a poison may be lodged in the economy, without our being able to suspect the fact by the analysis of the urine. As that portion of the poison which has been absorbed gradually decreases up to a certain period, it is quite impossible, and even absurd, to attempt calculating the amount of the poison which has been administered, by the quantity found in the viscera, putting other sources of error out of the question, such as vomiting, loss during experiments, &c.

It is an error to suppose that, because a poison remains a long time in the system, it will continue so for an indefinite period, for which nitrate of silver is administered to dogs; the metal may be found in the liver five months afterwards, but not after seven months. It must be supposed that the mercury, lodging so long in the viscera, becomes in some degree *tolerated* there. M. F. Orfila believes, with his uncle, that antidotes may do much good, and neutralize the action of certain poisons, even when the latter have already passed into the blood, the liver, spleen, &c., both by forming less poisonous compounds, and by giving rise to certain combinations, which are more easily eliminated.—*Med. News.*

Mr. Faraday.—He who is universally acknowledged to be the first chemist in the world—the pride of science and the especial boast of England—Michael Faraday, was born in 1794. He was the son of a blacksmith who bound him to a bookbinder in London, with whom he served out an apprenticeship till he was twenty-one years of age. He had no other education than what he secured by indomitable perseverance under the most trying and mortifying circumstances. Having had the luck to hear a lecture by Sir Humphrey Davy, a ticket of admission having been presented to him for the evening, an instantaneous conviction of his own inherent powers seems to have flashed before his mind. He made the acquaintance of Sir Humphrey, and afterwards became his assistant, secretary, friend, and finally his successor. It is well known that Sir Humphrey, in speaking of his own achievements in science, said that his greatest discovery was made when he found Michael Faraday. We have been present at the Royal Institution when the very aisles were filled with peers of the realm, standing for want of seats to listen to the learning and wit of this model lecturer. He is the first and only chemist we ever heard who made the science irresistibly fascinating. The charm is in his natural simplicity—for he is not graceful—his colloquial freedom, and unexpected and playful sayings, which prevent any tendency to weariness in the audience, combined with a kind and winning manner of address. Mr. Faraday puts on no airs, and has the good sense to treat everybody with marked politeness. In raising himself to distinguished fame, he has retained every former personal friendship, and he is still always accessible

to the people. In lecturing, he never had a note before him when we have been present, nor did his lectures appear to have been very methodically arranged. To what height might chemistry rise in the medical schools of this country, if those who teach it possessed the energy, enthusiasm, sprightliness, learning and suavity, that distinguish the leading chemist of England.—*Boston Med. and Surg. Journal.*

Charcoal Cushions for Deodorization.—A. S———, a patient under my care in the Hackney Union Infirmary, has for some time "passed every thing under her," and thereby become a nuisance and cause of complaint to the other patients in the ward. Eleven days ago, I adopted the plan of placing beneath her a calico bag two feet square, partly filled with Irish peat-charcoal, so as to form a sort of a cushion and absorbing medium. It has had the happy effect—which continues even now, without any necessity for changing the charcoal—of completely neutralizing all unpleasant odor; and if the bed becomes partly wet all the offensive ingredients are absorbed and neutralized by the charcoal, which thus is a most simple means of remedying a great nuisance, and one that requires the most strict attention at best to prevent; and that attention is often difficult and always expensive to procure. In cases of incontinence of urine particularly, and indeed all attended with fœtid discharges, cancer, compound fractures, &c., this plan, or some modification of it, might be adopted with advantage. I have been informed that some of the same material has been placed in the urinals of the South-Western Railway, with equally good results, in the prevention of unpleasant odor; and that even after it had been unchanged for some weeks, the fluid that percolates has been found, by chemical analysis, to contain little or no trace of the organic or saline products of urine. The fact induced me to try it as above. An argument in favor of its adoption in hospitals and lunatic asylums is, that the peat, after its deodorizing properties are exhausted, becomes more valuable for the purpose of manure, so that its use is without expense.—*Boston Medical and Surgical Journal*, April 1852, *from Mr. Howell, in London Lancet and Dublin Medical Press.*

On the Composition of Cocoa-Nut Juice. By WILHELM M. LOEWENICH, of Erlangen.—In 1000 parts of this cocoa-nut liquid, I found,

Water	900.88
Sugar	4.43
Gum	17,67
Extractive matters (fat)	28.29
Salts soluble in spirits of wine .	5.44
Salts not soluble in spirits of wine .	6.29
	100.0000

Of the individual salts I only determined the acids quantitatively, as the material was not enough to do the same with the bases. In 1000 parts I found,

Hydrochloric compounds . .	1.708
Phosphoric compounds .	1.633
Sulphuric acid compounds . .	2.29

Poisoning by Oleum Gaultheriæ. By THOMAS J. GALLAHER, M. D., of Pittsburg, Penn.—[In the Medical Examiner for June 1852, we find the details of a case of poisoning, where a child nine years of age swallowed, as near as could be ascertained, about half an ounce of the oil of wintergreen, from which he recovered by treatment. We received it too late to be noticed at page 210. The concluding remarks of Dr. Gallaher are extracted for the benefit of our readers.—EDITOR.]

Remarks.—The principal object in reporting this case is to record the effects of the Oleum Gaultheriæ upon the human subject, when given in an over dose. But few instances of poisoning from this article are on record, and these are not accurately described, therefore the medicinal and toxicological properties of it are but imperfectly known. Writers describing gaultheria attribute to it only aromatic and slightly astringent properties. Instances are mentioned of death from its use in large doses, from its causing inflammation of the stomach.

The case above described clearly shows that this plant, or at least its essential oil, possesses more properties than are usually attributed to it. The peculiar symptoms which are produced by its specific action in this instance, were, 1st, great dulness of hearing, without a general disturbance of the cerebral functions; 2, a slow, laborious and loud respiration, not stertorous; 3, a most voracious appetite for food, accompanied by symptoms which indicated gastro-enteric inflammation. These symptoms plainly indicate that Oleum Gaultheriæ acts as a direct and powerful sedative, when given in an overdose, upon those nervous centres which govern the functions of hearing and respiration; and that it is a powerful irritant to the gastro-enteric mucous membrane, with which it comes in contact, lighting up in it intense inflammation, which inflammation was accompanied by a peculiarly morbid condition of the gastric nerves, as evidenced from the great appetite with which it is attended. It does not appear to exert any specific influence over the cerebro-spinal centres generally, but only upon a few situated in the medulla oblongata.

The Union Medicale states that 1812 there were 537 medical men practising in Paris, whilst in 1851 there were 1,352, being an augmentation of 815 in forty years. The population of Paris in 1812 was 547,756 inhabitants, or 1,018 persons for each medical man; at present it is 900,000, or 666 for each medical practitioner.—*Ibid.*

Analysis of Bedford [Pennsylvania] Spring Water.—By J. Cheston Morris.—One pint of the water evaporated at 240° F., yields of solid residuum . . . . . grs. 22.201

CaO, CO_2	Carbonate of Lime	2.120	
CaO, SO_3	Sulphate of Lime	11.274	
MgO, So_3	Sulphate of Magnesia	3.974	
$(Al_2 O_3 + Fe_2 O_3) SO_3$	Sulphates of Alumina and Iron	1.280	
NaO, SO_3	Sulphate of Soda	3.092	
NaCl	Chloride of Sodium	0.343	
SO_3	Free Sulphuric Acid	0.128	
SiO_3 &c.	Organic matter and Silica	*trace*	22.201

"In the estimation of the iron as a persulphate, there is probably an error, which would, if corrected, increase slightly the amount of free sulphuric acid. The quantity of iron and alumina is so small as to render it almost impossible to separate them correctly."*

Medical Examiner, June 1852.

The Voltaic Pile.—The President of the French Republic has published a decree offering a reward of 50,000 francs (2,000*l.*) to such persons as shall render the voltaic pile applicable with economy to manufactures, as a source of heat, or to lighting, or chemistry, or mechanics, or to practical medicine. Persons of all nations may compete for this prize, and the competition is to be open for five years.—*Ibid.*

On the Hydrated Peroxide of Iron and Magnesia as Antidotes in poisoning with Arsenic. By J. Haidlen.—The author has satisfied himself by experiments, that to completely precipitate 1 part of arsenious acid within five minutes by hydrated oxide of iron, 22 parts of the latter are required. Some which had been kept for a year had lost more than two-thirds of its power; in another case it had lost one-third of it. As it is well known on acconnt of this property of the hydrated oxide of iron, Fuchs has recommended the mixture of a solution of persulphate of iron, which yields from 17 to 18 per cent. of the hydrated peroxide dried at 212° F., with excess of caustic magnesia. In the Wurtemberg Pharmacopœia the mixture of perchloride of iron with excess of magnesia is prescribed. The author finds that both mixtures precipitate the arsenious acid equally as well as the pure hydrated peroxide of iron, so that there is no chemical objection to their use.—*Chem. Gaz.*, May 1852, from *Jahrb. fur Prakt. Pharm.*, vol xxiii. pp. 196.

*Can sulphuric acid exist in a free state in the presence of an excess of carbonate of lime?

Minutes of the College.

At a stated meeting of the Philadelphia College of Pharmacy, held 3d month 29th, 1842.

Since the last stated meeting, the Board of Trustees have elected Joseph B. McMackin, William W. D. Livermore, Caleb R. Keeney, Thomas S. Wiegand, Charles S. Braddock and Evan T. Ellis, members. By their minutes the College was also informed that a Public Commencement had been held, and the Degree of Graduate in Pharmacy had been conferred upon the Graduates of the Institution, whose names were published in the last number of the Journal.

The Delegates appointed to represent the College in the Convention held at New York, on the subject of establishing uniform standards for imported drugs and medicines, by which their admission should be regulated alike in all parts of the United States, reported they had attended at the time proposed, and participated in the proceedings of the Convention.

The following Report of the Publishing Committee, accompanied by the statement of the Treasurer was read:

To the Philadelphia College of Pharmacy.

"The Publishing Committee respectfully report,

That the Journal has been issued regularly since last report. A more general interest appears to be gradually awakening, manifested by an increased subscription list, and by the number of communications from distant contributors.

The suggestions brought forward in the last report relative to an increase of matter, have been carried out, so that each number embraces one-fourth more than formerly, in the same number of pages.

Notwithstanding this enlargement of volume, it is the opinion of many that the price charged for the work is greater than is usual for such periodicals, when its quarterly issue has been taken into consideration, and it has been hinted on several occasions that the work should appear at shorter intervals.

These, and other suggestions which have been made from time to time, have not been lost on the Committee and Editor, who desire to act in the matter in the way best adapted to advance the object for which the Journal was established, as well as to keep its finances in the healthy condition they now present.

Should any change be determined on by the Committee, it will probably have reference to the ensuing year, and the increased expenditure consequent thereon will have to be considered in any disposition that may be proposed in reference to the Balance in the hands of the Committee."

The Committee appointed by the Board of Trustees to bring forward names to represent the College in the National Convention reported several names. Charles Ellis, Daniel B. Smith and William Procter, Jr., having received a majority of votes, were declared duly elected as delegates to the Convention to be held in this city.

Being the time for holding the annual election, the following named members were duly elected to the respective offices:

President—Daniel B. Smith.
1st Vice-President—Charles Ellis.
2d Vice-President—Samuel F. Troth.
Secretary—Dillwyn Parrish.
Treasurer—Ambrose Smith.
Corresponding Secretary—Joseph C. Turnpenny.

Publishing Committee.

Prof. Robert Bridges, Charles Ellis,
Edward Parrish, William Procter, Jr.
Alfred B. Taylor.

Trustees.

Warder Morris, William Procter, Jr.
Robert Bridges, John H. Ecky,
Edward Parrish, William P. Troth,
Daniel S. Jones, Caleb H. Needles.

Committee on Sinking Fund.

Warder Morris, Samuel F. Troth,
Ambrose Smith.

Then adjourned.

Dillwyn Parrish, Secretary.

Editorial Department.

PHARMACEUTICAL CONVENTION OF 1852.—We have received several communications from gentlemen residing in towns where no organization exists among the apothecaries, who feel a strong interest in the approaching Convention, asking whether, from not being members of pharmaceutical societies, they are ineligible to attend the Convention. It is gratifying to find our brethren at a distance awakening to this subject. Individuals who will come a long distance to attend the sittings of such a body, actuated by a feeling of interest in its objects, can hardly fail to prove useful members, and should be admitted, in our opinion, to seats, and to partake in its deliberations, if not in its decisions. When it is considered that the Convention of last year was called for a special object, whilst that called for October next has reference to the interests of the whole profession, we cannot but view the intended gathering as an initiatory movement—as a general call with a view to future organization—rather than as an adjourned meeting of an organized body, adapted in its constitution to the object it is intended to effect. Hence it would have been wise to have given a general call to pharmaceutists throughout the United States to meet, and, after organizing, determine on the future sources of its delegates. If that Convention should be but the commencement of a national association, as we believe, its healthy continuance will require it to be constituted of regular delegates having credentials from pre-determined authorities. If this be admitted, from whom shall the delegates come? If they are to be confined to permanent local societies, the larger part of the apothecaries of the country would be unrepresented. With due deference to a better plan, we would suggest that any *ten* established apothecaries and druggists, located in one place or neighborhood, where *no organization exists*, should be entitled to send a delegate to the Convention. This course would give a degree of authority to such delegates, who, coming directly from the pharmaceutical ranks, could speak for their brethren at home. In places where organized societies are in existence, such societies should be empowered, if they desire it, to send a number of delegates proportioned to the number of apothecaries and druggists where they are located. Towns not numbering ten apothecaries should have the right to send a representative. This course would give a more liberal and republican character to the Association, and not confine its members to cities or institutions. Meanwhile,

we hope that *every* pharmaceutist, whose sympathies attract him toward the Convention, will come, as there is every reason to believe that, on the first sitting of the delegates, measures will be taken to extend to them a participancy in its deliberations, if not in its decisions.

It has been repeatedly asked, what will the proposed Convention find to do? Will it be a mere formal organization without vitality, or a feasible object to accomplish, which will pass resolutions, publish them, and then disperse, satisfied that the profession will be improved and elevated? We trust that no such useless and unworthy results will be pointed to hereafter as the best fruits of the Convention of 1852. It is action, not talking, that is wanted; it is wisdom, not eloquence, that is needed; it is conscientious pursuit of the general good, not individual ambition, that is desired; and it is a generous sacrifice of knowledge and influence by the better educated and successful, on behalf of those whose want of qualifications and success arises more from the force of circumstances, than from disinclination to improve their practice.

Among the subjects which merit the action of the Convention, a few will be noticed: 1st, The plan of local organization best calculated to subserve the interest of those concerned; 2d, Pharmaceutical education as it relates to the studies pursued, the manner of teaching, and the practice of the shop; together with a consideration of the means most effectual for encouraging ill-qualified established apothecaries to improve their practice.

3d, The Convention, viewing itself in the light of a scientific association, might receive written communications of scientific or industrial interest connected with pharmacy, and, if worthy, direct them, to be published in its transactions. In this connexion, it would be desirable that members should bring every offering worthy of a notice, whether in the form of draughts or models of apparatus; practical suggestions in manipulation, or criticisms on processes; specimens of, or information relating to the natural productions available in our art; and lastly, sketches of the state of pharmacy among their constituents.

4th, With a view to more efficient action than could be effected in a Convention, standing committees might be appointed, to whom subjects should be committed for investigation during the recess, previous to the next annual meeting. These committees might be entrusted with such subjects as the following, viz: 1st, What are the *actual* results of the law against adulterated drugs, chemicals and medicinal preparations, based on an examination of the custom house records as compared with the drugs on sale. 2d, To what extent is home adulteration practised, where is it most practised, and what suggestions can be made to lessen or prevent it? 3d, What is the actual practice and customs of the apothecaries generally throughout the Union in relation to the employment of the formulæ of the United States Pharmacopœia in making their preparations? 4th, To what

extent the practice of medicine and pharmacy are united in the same individual, in places having more than two thousand inhabitants.

5th, Other committees of qualified individuals, might be entrusted with more special subjects for investigation, as, for instance, 1st, what are the causes which occasion the decomposition of syrups, and what means can be suggested to increase their permanence? 2d, What form of evaporating apparatus, adapted to the limited demand of the apothecary, is best calculated by its simplicity of construction, cheapness and durability, to meet his wants? 3d, Whether is it better, in making hydro-alcoholic extracts, to employ alcohol and water consecutively, or mixed in the form of diluted alcohol, deciding the question by the activity of the resulting product, as ascertained by chemical analysis, if the active constituent is well defined, or by therapeutic trials if it is not? 4, In the process of displacement or percolation as applied to the extraction of drugs, what is the degree of exhaustion which should determine the conclusion of the process, (when the quantity of product is not necessarily pre-determined, as in tinctures, wines, etc.,) in view of the effects or expense of evaporation? 5, What is the best arrangement for filtering fixed oils, combining simplicity of construction with effectiveness of action? 6th, What is the degree or amount of the deteriorating action of light on the fixed and volatile oils, tinctures and wines, when kept properly closed, and whether it would not be better to protect these substances, or some of them, from the influence of light in our shops?

Chemistry, of all the sciences, is that most closely connected with pharmacy, and most worthy of the attention of its practitioners. The many able individuals that now grace our profession should bring some of the fruits of their chemical observations, irrespective of their application to pharmacy, that a taste for this noble pursuit may be encouraged.

Such a course would, in a few years, render the meetings of the *American Association of Pharmaceutists* seasons of rich intellectual enjoyment to those who participated, and greatly advantageous to those at home, from the many useful and interesting memoirs that would scarcely fail to emanate from a body so organized.

The prospective adoption of a code of ethics should be considered, and the preliminary steps taken to digest and mature it. Any action of the Convention in this direction cannot be too cautiously and carefully taken, in view of the crippled condition of druggists and pharmaceutists as a body, in reference to quackery, directly or abettingly; as well as to the great want of uniformity that exists in shop practice. The association should aim at reformation in these respects, and especially by a thorough and faithful adoption of our National Pharmacopœia as the rule of practice. Deep rooted evils in a profession can rarely be removed by sweeping legislation, unless the measures are enforced by despotic power. Let the well disposed among us, therefore, show practically the working of a higher standard,

as an example to those not now willing or able to adopt it, which will be more influential than volumes of precepts.

WORKS OF THE CAVENDISH SOCIETY.

Handbook of Chemistry. By LEOPOLD GMELIN, Professor of Chemistry in in the University of Heidelberg, &c. Six volumes octavo. Translated by HENRY WATTS, B. A., F. C. S., Assistant in the Birkbeck laboratory, University College, London. 1848–49–50–51.

The "Handbook of Chemistry" has long enjoyed a high reputation in Germany, where its author, the veteran Chemist, Privy Counsellor Leopold Gmelin, announced his intention of issuing the first volume of a fourth edition in 1843. The long interval of fifteen years that had elapsed since the previous edition, rendered a revision of the work highly necessary in order to incorporate the very numerous discoveries and improvements introduced into the science since that time. The author observes, "I have studied in the present edition, still more than in the preceding, to incorporate into a systematic whole every fact which appears to be worthy of confidence, carefully referring it to its first observer, or source, as completely as I could compatible with due brevity. Thus the work may serve not only to communicate fundamental instruction in the chemistry of the present day, but to indicate the original store-house from which I have made my selection, so that others may be guided directly to the spot. I have also sought to render this edition more generally useful than the previous one, by embracing in its details a fuller exposition of the most important subjects of pharmaceutical, technical, and analytical Chemistry."*

As the "Handbook" gradually evolved from the German press, occasional extracts and reviews in the English Journals directed the attention of those not familiar with the language of the author to it, and when it was announced that the work was to be translated and published under the auspices of the Cavendish Society, much satisfaction was evinced by the increased number of subscribers to that useful Association.

Thus far, only the inorganic part of the Handbook has been translated and published, comprised in six octavo volumes; and a large number of English chemical readers have had an opportunity of examining the book, and can testify to its great comprehensiveness.

To give a review, or even an analysis of the "Handbook," such as it deserves, is not our object; *space* and *time*, and perhaps inability, will prevent it, but the following is a scattered outline of the groups of subjects:—The *first* volume commences with an introductory chapter which includes a short outline of chemical progress in the modern era of history, followed by a full exposition of cohesion, crystallization and adhesion.

*Pharm. Journ., vol. iii., page 84.

Part I. The Philosophy of Chemistry; affinity treated under the following heads, viz: 1, fundamental notion of affinity; 2, range of affinity; 3, formation of chemical compounds; 4, decomposition of chemical compounds; 5, strength of chemical affinity; 6, origin and nature of the phenomena of affinity.

Part II. Special Chemistry; 1, the chemistry of the imponderables, light, heat and electricity, with which the first volume concludes.

The *second* volume discusses the non-metallic elements and their mutual compounds. The *third, fourth, fifth* and *sixth* volumes are occupied with the metals and their compounds with each other, and with the non-metallic bodies. The metallic salts of all kinds, which, from their great number, are, to a large extent, passed over in all the ordinary treatises, have received due attention; and this feature will prove exceedingly useful to pharmaceutists who often need information on that class of substances.

In the discussion of a subject, the various authorities, whether separate works or isolated papers in the journals, are placed in a list at the head of the chapter, by which investigators are at once refered to the spring sources whence the author derived his information. Its history is then succinctly given; then the natural sources of the substance; and lastly, its preparation, properties, affinities, &c. The author brings all the facts worthy of credence to bear on his subject with a discrimination and industry as wonderful as it proves useful.

The translation and preparation of the "Handbook" for the press was entrusted by the Cavendish Society to Mr. Henry Watts. The most extensive additions by the translator will be found in the first volume, which had been longest published, and embraced so many important subjects in the higher range of chemico-physical inquiries which of late years have been pursued with much success by Faraday, Regnault and others, as "the relation between atomic weight and density, the relation of light to magnetism, the calotype process, thermography, radiation and conduction of heat, expansion, specific heat of liquids and vapors, tension of vapors, liquefaction and solidification of gases, development of heat in chemical combination, decomposition of water by heat, development of electricity during the escape of high pressure steam, voltaic batteries, and the magnetic condition of all matter."

The organic part will be commenced this year, and will, when completed, be by far the most comprehensive treatise on this branch of chemistry extant. A review of this part of the German edition (Pharm. Journ., vol. vi., page 550,) says: "We are fully persuaded that no such philosophical digest of chemical science, in its most intricate and interesting department, has ever before been presented to the world. It is, in fact, one of the noblest monuments of industry, sagacity and candor, ever produced by one mind. By completing his Handbook in this same admirable manner, the

amiable and accomplished author will earn the lasting gratitude of every student and lover of chemistry.

"On surveying the preceding portions of this great chemical treasury, Baron Liebig was induced to address the publisher in the following eulogistic and well merited language: 'The industry, the conscientiousness, the carefulness and patience of the author excite the utmost astonishment. I do not believe that any other nation can exhibit a work which can be placed on a par with Gmelin's, or a man who combines such a vast compass of knowledge with the spirit and power to execute so colossal a labor.'"

The great size of the work prevented the publishers from taking hold of it, and, in presenting it to the English chemical reader, the Cavendish Society has conferred a valuable benefit.

Physiological Chemistry. By Prof. C. G. LEHMANN. Vol. I. Translated from the 2d edition by GEORGE E. DAY, M. D., F. R. S. London, 1851. Printed for the Cavendish Society, 1848-9 50-51.

This volume is the first of the publications issued by the Cavendish Society for the year 1851. The author has long been favorably known as a physiological chemist, and his book ranks high among the chemical literature of Germany. The translation of Dr. Day is made from the recent German edition. The work begins with a *methodological* introduction, wherein the present condition of physiological chemistry and the systems of its cultivators are discussed. The author, in entering upon his subject, endeavors to point out some of the numerous errors into which the most zealous elucidators of the chemistry of physiology have been led, which appear to him to have diverged in three directions:

"In the first place, too little attention has been directed to the laws of a true natural philosophy, whose simplest rules have in many cases been wholly disregarded; in the next place, the necessary casual connection existing between chemistry and physiology, as well as between histology and pathological anatomy, has too often been entirely neglected; and lastly, much misconception has arisen from the assumption that chemistry afforded a satisfactory solution to many questions which it is either wholly incompetent to answer, or which must, at all events, remain undecided in the present state of our knowledge," page 2.

Acknowledging that the use of hypotheses are indispensable in the prosecution of physical inquiries, he censures the custom too often exhibited of seizing on a few facts as the basis of a theory of the merest fiction, and says:

"Physiological chemistry has given rise to many delusions of this nature, owing to its imperfect development and to the necessity presented by physiology and pathology for chemical elucidation. Some few isolated deductions were drawn from superficial chemical experiments, and arranged in a purely imaginary connection by the aid of chemical symbols and formulæ, for whose establishment analysis in many cases did not even afford any sanc-

tion. Thus, for instance, in the attempt to form a conclusion regarding the metamorphosis of the blood from an elementary analysis of its solid residue, and of the composition of the individual constituents of the excretions, there is an utter absence of all scientific ground work; for, independently of the fact that the elementary analysis of so compound a matter as the blood is incapable of yielding any reliable results, and cannot, therefore, justify the adoption of any special chemical formula, it is assuredly most illogical to attempt to compare the composition of the blood collectively, with that of the separate excrementitious matters." Page 3, 4.

Whilst acknowledging the indebtedness of the physiologist to the chemist, he remarks:

"Animal chemistry is still wholly unable to afford us a precise, and at the same time a practically useful method of investigating the blood; and how should it be otherwise while we continue to be in doubt regarding the chemical nature of its ordinary constituents? The mineral substances of normal blood are not yet determined, or, at all events, continue to be made the subject of dispute. We scarcely know the names of the fatty matters it contains; one of its most important constituents, fibrin, cannot be chemically exhibited in a pure state; we are ignorant of the nature and mode of secretion of the globulin of the blood-corpuscles; we are still far from being able to separate and determine the so-called protein oxides; and we are also ignorant of the excrementitious substances occurring in the blood. How then, amid these and a thousand other uncertainties and doubts, can an investigation of the blood be scientifically and trust-worthily conducted? We analyze healthy and morbid milk, and yet we are ignorant of the substances whose admixture we call casein. The urine, in its morbid condition, presents many varieties; and yet our knowledge of this secretion, frequently as it has been analysed, amounts to little more than an acquaintance with the quantitative relations of some of its principal constituents; creatinin and hippuric acid have not been determined by an analysis, and doubts are still entertained by some chemists, (although most unjustly,) regarding the presence of the latter in human urine, whilst nothing absolutely is known regarding the most important pigment of this secretion. Many experiments have been made, and theories broached on nutrition and digestion, and yet to almost the present day the existence of lactic acid in the gastric juice has been contested. Although hypotheses are not wanting regarding the mode of action of pepsin, we know nothing of its chemical nature, and we are wholly ignorant of the proximate metamorphosis of albuminous bodies in the stomach during the process of digestion. Will Mulder be able, even with his most accurate analyses, to support his protein theory by the aid of sulphamide and phosphamide? Or is this term destined merely to indicate a past epoch in organic chemistry? When such is the state of animal chemistry, can we wonder that there should be obscurity regarding the chemical processes in the animal body, their various isolated and combined actions, their casual connexion and their dependence on external influences and internal conditions?"

Our author then goes on to show that the organic substrata of the animal body (the proximate constituents and their derivatives,) should be thoroughly understood before venturing an opinion on the nature of the processes. For this reason the first volume of his work is devoted to the description

of the proximate and mineral constituents of the animal body under the following classes, viz:

"*Non-nitrogenous acids.*
1, Butyric acid group. 2, Succinic acid group. 3, Benzoic group. 4, Lactic acid group. 5, Solid fatty acids. 6, Oily fatty acids. 7, Resinous acids.
Nitrogenous basic bodies.
1, Non-oxygenous alkaloids, aniline, &c. 2, Alkaloids containing oxygen, creatine, &c.
Conjugated acids. Hippuric acid, &c.
Haloid Bases and Haloid salts. Oxide of lipyl, glycerin, &c.
Lipoids. Cholesterin, &c.
Non-nitrogenous neutral bodies. Glucose, lactine, &c.
Coloring matters. Hæmatin, &c.
Extractive matters.
Nitrogenous Histogenetic substances. Protein compounds and their derivatives.
Mineral constituents of the animal body.

Professor Lehmann is a close adherent to the actual and demonstrable and discards all the theories of the marvellous influence of vital force, independent of chemical reaction. He observes:

"How long were the minds of natural philosophers haunted with an illusion that animal bodies possessed the power of generating mineral elements, as lime, iron, sulphur, &c., from other elements, or even from nothing! It was this method [alluding to the statistical method of comparing the gross constituents of the food with the gross secretions and excretions] alone which exposed the perfect nullity of the obstinately defended dogma of the 'vital force.'"

Our author places physiological chemistry first in importance among the scientific auxiliaries to medicine. He also disapproves of drawing the line between pathological and physiological chemistry, and believes it is not only unnecessary, but attended with disadvantage, to sever them, as the same laws and forces are exerted in diseased as in healthy matter, the chemical points of application being different. He is strongly opposed to what is termed meta-physiology, the physiology of life action and force, as contradistinguished from the chemical forces of organic matter.

"We have not hesitated to avow that we have assumed a thoroughly radical point of view in reference to specific vital phenomena and vital forces; for we cannot rest satisfied with the mysterious obscurity in which they have been artificially enveloped. With the physicist, we would uphold the reality of phenomena, and while we admit that the consciousness of the reality of matter is only the result of an abstraction, we regard this abstraction, by which we regard the Immaterial, the Spiritual and the Force, as originating in reality. We therefore believe with the diffidence beseeming the genuine student of nature, that it would be wiser and more conducive to the spread of true knowledge to adhere, in the study of vital processes, to matter, and to the laws by which it is determined, than, following the fictitious abstractions of dynamical processes, to assume that there exists in life a higher power of the spiritual forces pervading matter."

In the application of chemistry to physiology our author demands the most imperative adherence to truth in analytical results; he lays down the sole conditions upon which the formula for an organic substance should be accredited, and then points to the innumerable results which are turned out of the laboratories, under circumstances depriving them of all respect, and which are seized upon by physiologists to be woven into theories as truthful as the basis on which they are erected.

In describing a substance our author first gives its properties, then its composition, next its combinations, then its preparations, next its tests, and lastly, its physiological relations.

We would gladly give further illustrations of the work, but our space will not admit; whatever difference of views there may be in reference to vital phenomena in the abstract, Professor Lehmann's logical adherence to the strictly demonstrable in physiological chemistry will render his book a faithful record of the real progress of that branch of science.

The Life of the Hon. Henry Cavendish, including abstracts from his more important scientific papers, and a critical inquiry into the claims of all the alleged discoverers of the Composition of Water. By George Wilson, M. D. F. R. S. E. London, Printed for the Cavendish Society, 1851, pp. 478.

This account of Cavendish and his works very appropriately emanates from a Society which has adopted his name. Perhaps no instance is on record of an individual, so celebrated for his scientific researches, so elevated in his family connections, so long a resident of the metropolis of Great Britain, for fifty years a member of the Philosophical Society, and one of the wealthiest men in England, about whom so little is known, and whose personal history was obscured by so impenetrable a veil of reserve. Mr. Cavendish was one of the most eccentric, and withal one of the most modest men that ever lived, and perhaps would hardly credit that, forty years after his death, a large volume would be written, a large portion of which is occupied with a tiresome discussion as to his claims to the discovery of the Composition of Water. Dr. Wilson, the biographer, has had a scarcity of materials to build up so extensive a volume, and while most will admit that he has made out a good case for his subject, it is at the expense of a vast deal of repetition. The celebrated characters who, in person or through their friends, have laid claim to that discovery, have given a historical importance to the matter far greater than it deserves, as all will now admit that the great fact was gradually evolved during the pursuit of experiments on air by at least two individuals, and was not the result of *a priori* reasoning followed by direct experiment, as in Davy's discovery of Potassium.

Elements of Chemistry; including the applications of the Science in the Arts. By THOMAS GRAHAM, F. R. S., &c. *Second American, from an entirely revised and greatly enlarged English edition, with numerous wood engravings.* Edited, with notes, by ROBERT BRIDGES, M. D., Prof. of Chemistry in the Philadelphia College of Pharmacy, etc. Philadelphia, Blanchard & Lea, 1852. [Part I. pp. 430 octavo.]

We acknowledge the reception of the first part of this excellent treatise, from the publishers, with pleasure. The author has long been engaged on the work, and is giving a more than usual amount of time and research to its revision, not only as regards those parts where the progress of science renders it absolutely necessary, but in numerous tabular expositions, in an increased accuracy of the numbers, in an improved arrangement of subjects, and in the adoption of hydrogen as unity in equivalent proportions, so as to agree with the larger number of English chemical writers. The subject is carried as far as the earthy-basic metals, including the physics of chemistry, chemical philosophy, the non-metallic elements and their mutual compounds, and the alkaline, alkaline-earthy, and earthy-basic metals and their compounds. Among the special additions we may notice the table of specific heat of gases, Mr. Hutchinson's table of the heat-resisting power of building materials, the method of obtaining the latent heat of volatile liquids, the recent results of Faraday and others in refrigeration by means of solid carbonic acid, with a figure of Thilorier's apparatus, observations on the effusion and transpiration of gases, quite new, Regnault's condenser hydrometer, the subject of specific heat, and the table of the specific gravity of gases and vapors, have been much extended, and the discoveries and improvements in apparatus in relation to chemical polarity have been added and illustrated.

In regard to the arrangement of subjects, Prof. Graham has placed ammonia under the head of nitrogen; oxalic acid, the *hydrides* of carbon, and cyanogen, under the head of carbon; the new compounds of sulphur and oxygen hydrosulphuric acid and sulphide of nitrogen, under the head of sulphur, and the compounds of phosphorus with hydrogen and sulphur under phosphorus. This part of the work has been much extended, portions of it re-written, and the illustrations greatly increased in number and beauty. The subjects of water, atmospheric air, the varieties of phosphoric acid, and the oxygen compounds of chlorine, have been more especially improved. So much for the author, who, as Prof. Bridges justly remarks, has left but little for the Editor. Owing, however, to the publication of the English edition in small parts, at considerable intervals, several recent and important discoveries have been omitted in the English edition. The introduction of these, among which may be mentioned Deville's anhydrous nitric acid and red phosphorus, and the correction of misprints and errors incident to all authors, and which the well known accuracy of Prof. Bridges is well calculated to meet, give a decided advantage to the Ameri-

can edition, especially in view of the excellent style of the typography and engravings, which are very creditable to the publishers. As a manual for the guidance of the student of general chemistry, the "Elements" of Prof. Graham enjoy deservedly the very highest rank among English chemical treatises.

Dictionnaire des Alterations et Falsifications des Substances Alimentaires, Medicamentenses et Commerciales avec l'indications, des moyens de les reconnaitre. Par M. A. CHEVALLIER, Pharmacien Chimist, Prof. à Ecole de Pharmacie, etc. Vol. II., Paris, 1852, pp. 580 with plates.

The first volume of this work was noticed succinctly on page 95, vol. xxiii. of this Journal. The present volume, which completes the book, is more extensive than the first, and has required, from the nature of several of its articles, a greater amount of labor. The subjects extend from L to Z, and include a large number of important articles in medicine and the arts. Among the subjects which have attracted most attention among alimentary substances, are *milk, honey, pepper, common salt, sugars, vinegar, and wines;* of commercial substances, *papers, resins, saltpetre, sal soda, soaps, sulphates,* and *tobacco;* and, of the very numerous medicinal substances, a few are *magnesia, manna, sulphur, opium, cinchona, scammony, syrups, sulphate of quinine* and other medicinal sulphates.

M. Chevallier does not confine his subject to artificial products, but includes nearly the whole range of medicines, barks, leaves, flowers, seeds, but many of the articles go no further than the same subjects are carried in the works on Materia Medica, and are introduced as much to swell the size of the work as for any tangible means of judging they offer.

The work, as the title indicates, is by no means solely directed to the pharmaceutist; indeed its most elaborate articles are on subjects connected with the manufacturing arts, as soaps, vinegars, wines, breadstuffs, milk, etc. As a whole, the "*Dictionnaire*" is well worth a place in the pharmaceutical library, and contains a large amount of information derived from innumerable sources. We shall occasionally publish a few extracts from it.

THE COMMUNICATION of DR. W. MANLIUS SMITH, of Manlius, New York, having arrived too late for this number, will appear in the October issue.

OUR JOURNAL.—We consider it objectionable, as a general rule, to issue a journal before it is due, and have endeavored to be as punctual to the beginning of the month as possible. In the present instance, to accommodate ourselves, we have served our subscribers perhaps before their appetites have awakened.

PHARMACY IN RICHMOND.—Just as we were going to press the following call, issued to the Richmond apothecaries by some of their number, was received from Mr. Laidley. The meeting to which it refers was subsequently held, and measures taken for the organization of a pharmaceutical society. We understand that one of the proposed conditions of membership, is *proprietorship in business*, which is certainly an error in judgment, as some of the best members of our College have been those not proprietors.

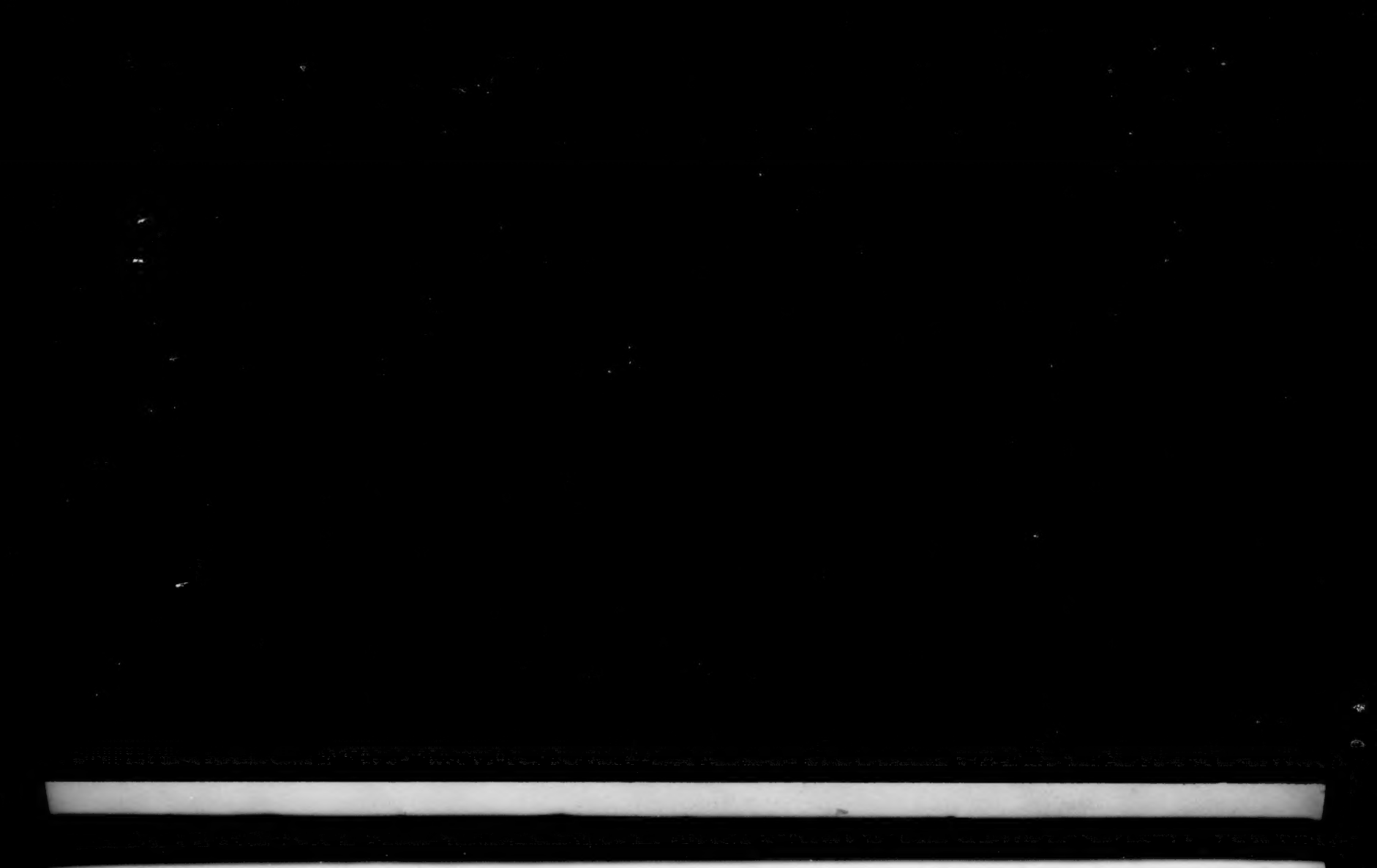
The undersigned, believing that by friendly co-operation among themselves, their respectability will be increased; their standing in the community will become more elevated, faults in their profession be remedied, evils to which they are now subjected be removed; that their art may be more systematized, and better regulated; a more friendly feeling towards each other be excited amongst them, their mutual interests advanced, and the public good promoted; do most earnestly call upon their brethren engaged in Pharmaceutical pursuits, to meet at the Gentlemen's Parlor, Exchange Hotel, on Friday evening, 11th inst., at 8 o'clock, for the purpose of considering the advantages that would result to all of them, from the formation of some organized Association, that would have for its object the above named desirable ends; as well as to encourage among themselves mutual improvement in the knowledge so necessary to a proper discharge of those duties, (both to themselves and the public,) which their situations as men occupying positions among the most responsible in life, impose upon them.

As the organization which it is now proposed to form, would contemplate the good of all its members, it is most earnestly hoped that all the Druggists and Apothecaries who feel any interest in this important subject, will cordially unite their intelligence and talents in an effort to accomplish the above named ends, and that the proper preliminary steps will be taken for the formation of a society of the Apothecaries in this city, which will prove beneficial to its members, an honor to their profession, and a credit to the city of Richmond.

ANDREW LESSLIE,	SEABROOK & REEVE,	H. BLAIR,
S. M. ZACHRISSON,	ADIE & GRAY,	CHAS. MILLSPAUGH,
PURCELL, LADD & CO.,	PEYTON, JOHNSTON & BRO.,	ALEX. DUVAL.

Richmond, June 8th, 1852.

PHILADELPHIA COLLEGE OF PHARMACY.—We would call attention to the advertisement of the School of Pharmacy of this Institution. It will be perceived in addition to the usual full courses on Chemistry, Pharmacy and Materia Medica, that Prof. R. P. Thomas will give a preliminary course to *matriculants* on Medical Botany, which will prove extremely useful to the students who have not given their attention to this branch of science before entering the school.

The Philadelphia Medical and Surgical Journal, Edited by an Association Physicians.—We have received the first and second numbers of this new Medical Journal which is issued semi-monthly, each number containing sixteen pages.

ERRATUM.—*Purgative Syrup of Jalap.* In the formula for this syrup in the last number of the Journal at page 169 read "*jalap eight ounces*" instead of "*jalap an ounce.*"